OLIN CORPORATION

WALLISVILLE ROAD

OLIN CORP-SP OLIVER

TXD000607028

EPA

POTEN L HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

REGION	SITE NUMBER (to be assigned by HQ)
6	TX1538

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition *(Section II)*. File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: S.P. OLIVER YARD (SO. PACIFIC TRANS CO.) & MUSTANG INDUSTRIAL EQUIPMENT CO. (Formerly Olin-Houston Chemical Co.)

B. STREET (or other identifier): 7600 Wallisville Road

C. CITY: Houston

D. STATE: TX

E. ZIP CODE: 77020

F. COUNTY NAME: Harris

G. SITE OPERATOR INFORMATION

1. NAME: S.P. Oliver Yard: Mr. Dan Novasad, Yard Manager
Mustang Industrial: Mr. Chuck Chalker, Prop. Manager

2. TELEPHONE NUMBER: (713) 223-6591 (713) 460-2000

3. STREET: Southern Pacific Trans. Co., Wallisville & Lockwood Rd.

4. CITY: P.O. Box 15640 Houston

5. STATE: TX

6. ZIP CODE: 77020

H. REALTY OWNER INFORMATION (if different from operator of site)

1. NAME: S.P. Oliver Yard-Same as 1g. above
Mustang: Eureka Investment Co.

2. TELEPHONE NUMBER:

3. CITY: c/o Mr. Chuck Chalker, (Same address & telephone number)

4. STATE:

5. ZIP CODE:

I. SITE DESCRIPTION: An 18 acre site formerly occupied by a pesticide formulating plant owned and operated by the Olin Corporation.

J. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE

II. TENTATIVE DISPOSITION (complete this section last)

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (mo., day, & yr.):

B. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE

C. PREPARER INFORMATION

1. NAME: Bill Carrothers

2. TELEPHONE NUMBER: (214) 742-4522

3. DATE (mo., day, & yr.): 12/29/80

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION

1. NAME: Mr. Bill Carrothers

2. TITLE: FIT Chemist

3. ORGANIZATION: Ecology and Environment, Inc.

4. TELEPHONE NO. (area code & no.): (214) 742-4522

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
Mr. H.K. Ray	Ecology and Environment, Inc. 1509 Main, Dallas, TX 75201	(214) 742-4522
Mr. Clarence Johnson	TDWQ, Deer Park, TX	(713) 479-5981

C. SITE REPRESENTATIVES INTERVIEWED (corporate officials, workers, residents)

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
David S. Harcus	Equipment Dispatcher Seatrain Pacific Services	Salina Street Office Houston, TX 77020
Mr. Ben Torrance	Finance Manager Mustang Industrial Equipment Co.	7607 Wallisville Rd. Houston, TX 77020
Mr. Chuck Chalker	Property Manager Mustang Industrial Equipment Co.	" "
Mr. Dave Hesser	Chemical Engineer Nutro Products Corp.	7610 Wallisville Rd. (P.O. Box 21187) Houston, TX 77026

REVIEWED BY (6ASASC): Gail Ricardi 1/15/81

Continued From Front

III. INSPECTION INFORMATION (continu

D. GENERATOR INFORMATION (sources waste)

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED
Olin Chemical Co. Houston Plant	Now at (501)378-3600	Olin Agricultural Chemicals North Little Rock, AR	Pesticides
(Historic-1950-1970)			

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED
According to Jim Brown, Olin Environmental Affairs Consultant: During clean-up operations in 1972, about two truck loads of waste material were collected at this site and hauled to the site of Pasadena Chemical Corp., Jackson Road, Pasadena, TX.			

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS
These wastes were disposed of at the phosphate rock processing.		Jackson Road Plant, together with the wastes from

G. DATE OF INSPECTION (mo., day, & yr.)	H. TIME OF INSPECTION	I. ACCESS GAINED BY: (credentials must be shown in all cases)
12/4/80	-9:00 am	[X] 1. PERMISSION [ ] 2. WARRANT

J. WEATHER (describe)
Misty; 50° F; Calm

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN (mark 'X')	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER			
b. SURFACE WATER			
c. WASTE			
d. AIR			
e. RUNOFF	X	Houston EPA Lab, Houston, TX	
f. SPILL	X	" " " " "	
g. SOIL			
h. VEGETATION			
i. OTHER (specify)	X	During this recon inspection, samples were taken at points adjacent to old Olin Plant site.	

B. FIELD MEASUREMENTS TAKEN (e.g., radioactivity, explosivity, PH, etc.) See photos #1 & 3.

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS
None		

Continue On Page 3

Continued From Page 2

IV. SAMPLING INFORMATION (continued)

C. PHOTOS

1. TYPE OF PHOTOS: [X] a. GROUND [ ] b. AERIAL
2. PHOTOS IN CUSTODY OF: EPA, Region VI-Dallas, TX (See attachments)

D. SITE MAPPED?

[X] YES. SPECIFY LOCATION OF MAPS: Settegast, TX 7.5' Quadrangle
U.S. Geological Survey-(See attached map & sketch)

E. COORDINATES

1. LATITUDE (deg.-min.-sec.): 29° 47' 20" N
2. LONGITUDE (deg.-min.-sec.): 95° 17' 20" W

V. SITE INFORMATION

A. SITE STATUS

[ ] 1. ACTIVE *(Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)*

[X] 2. INACTIVE *(Those sites which no longer receive wastes.)*

[ ] 3. OTHER *(specify):* _____ *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?

[X] 1. NO [ ] 2. YES *(specify generator's four-digit SIC Code):* _____

C. AREA OF SITE (in acres)

18

D. ARE THERE BUILDINGS ON THE SITE?

[ ] 1. NO [X] 2. YES *(specify):* See attached sketch

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

X'	A. TRANSPORTER	X'	B. STORER	X'	C. TREATER	X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER *(specify):*		6. OTHER *(specify):*		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER *(specify):*
					9. OTHER *(specify):*		

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this for..

[ ] 1. STORAGE [ ] 2. INCINERATION [ ] 3. LANDFILL [ ] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL

[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[ ] 1. LIQUID [X] 2. SOLID [ ] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[ ] 1. CORROSIVE [ ] 2. IGNITABLE [ ] 3. RADIOACTIVE [ ] 4. HIGHLY VOLATILE
[X] 5. TOXIC [ ] 6. REACTIVE [ ] 7. INERT [ ] 8. FLAMMABLE

[ ] 9. OTHER *(specify):*

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

No

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT 50	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE lbs.	UNIT OF MEASURE	UNIT OF MEASURE
[ ] (1) PAINT, PIGMENTS	[X] (1) OILY WASTES	[ ] (1) HALOGENATED SOLVENTS	[ ] (1) ACIDS	[X] (1) FLYASH	[ ] (1) LABORATORY, PHARMACEUT.
[ ] (2) METALS SLUDGES	[ ] (2) OTHER(specify):	[ ] (2) NON-HALOGNTD. SOLVENTS	[ ] (2) PICKLING LIQUORS	[ ] (2) ASBESTOS	[ ] (2) HOSPITAL
[ ] (3) POTW		[ ] (3) OTHER(specify):	[ ] (3) CAUSTICS	[ ] (3) MILLING/MINE TAILINGS	[ ] (3) RADIOACTIVE
[ ] (4) ALUMINUM SLUDGE			[X] (4) PESTICIDES	[ ] (4) FERROUS SMELTING WASTES	[ ] (4) MUNICIPAL
[ ] (5) OTHER(specify):			[ ] (5) DYES/INKS	[ ] (5) NON-FERROUS SMLTG. WASTES	[ ] (5) OTHER(specify):
			[ ] (6) CYANIDE	[ ] (6) OTHER(specify):	
			[ ] (7) PHENOLS		
			[ ] (8) HALOGENS		
			[ ] (9) PCB		
			[ ] (10) METALS		
			[ ] (11) OTHER(specify):		

D. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE *(place in descending order of hazard)*

1. SUBSTANCE	2. FORM (mark 'X')			3. TOXICITY (mark 'X')				4. CAS NUMBER	5. AMOUNT	6. UNIT
	a. SOLID	b. LIQ.	c. VAPOR	a. HIGH	b. MED.	c. LOW	d. NONE			
Aldrin	X			X-				309-00-2	UNKNOWN	
Dieldrin	X			X				60-57-1	"	
Toxaphene	X				X			8001-35-2	"	
DDT	X				X			50-29-3	"	
BHC (Lindane)	X				X			58-89-9	"	
Heptachlor	X				X			76-44-8	"	
Sevin	X					X		63-25-2	"	

SUBSTANCES ABOVE WERE FORMULATED BY OLIN WHEN PLANT WAS OPERATIONAL

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

[X] A. HUMAN HEALTH HAZARDS

Suspected contaminants are virtually adjacent to the backyard of an occupied residence.

Continued From Page 4

III. HAZARD DESCRIPTION (continued)

☐ B. NON-WORKER INJURY/EXPOSURE

☐ C. WORKER INJURY/EXPOSURE

☐ D. CONTAMINATION OF WATER SUPPLY

☐ E. CONTAMINATION OF FOOD CHAIN

☐ F. CONTAMINATION OF GROUND WATER

☒ G. CONTAMINATION OF SURFACE WATER

Possible because of water flowing past the area of suspect contamination (Most of these insecticides are nearly insoluble in water.) See photo #3. Results of samples taken will determine the extent of hazard.

☐ H. DAMAGE TO FLORA/FAUNA

☐ I. FISH KILL

☐ J. CONTAMINATION OF AIR

☐ K. NOTICEABLE ODORS

☒ L. CONTAMINATION OF SOIL

Piles of material suspected to be pesticides from previous formulation operations were observed and sampled during this inspection. See photo #1 & sketch. Results of samples taken will determine the extent of contamination.

☐ M. PROPERTY DAMAGE

Continue On Page 7

Continued From Page 6

VIII. HAZARD DESCRIPTION (continued)

☐ N. FIRE OR EXPLOSION

☐ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

☐ P. SEWER, STORM DRAIN PROBLEMS

☐ Q. EROSION PROBLEMS

☒ R. INADEQUATE SECURITY

No security where suspected contamination was observed. See photo #3.

☐ S. INCOMPATIBLE WASTES

VIII. HAZARD DESCRIPTION (continued)

☐ T. MIDNIGHT DUMPING

☐ U. OTHER (specify):

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE (specify units)
1. IN RESIDENTIAL AREAS	100	100	50	¼ mile
2. IN COMMERCIAL OR INDUSTRIAL AREAS	50	50	24	¼ mile
3. IN PUBLICLY TRAVELLED AREAS	10	10	0	¼ mile
4. PUBLIC USE AREAS (parks, schools, etc.)	20	0	1	¼ mile

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER (specify unit)	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
20 feet	Southeast	One well 1000' West of site
D. POTENTIAL YIELD OF AQUIFER	**E. DISTANCE TO DRINKING WATER SUPPLY (specify unit of measure)**	**F. DIRECTION TO DRINKING WATER SUPPLY**
30 gallons/min.	10 miles	East

G. TYPE OF DRINKING WATER SUPPLY

☒ 1. NON-COMMUNITY < 15 CONNECTIONS ☒ 2. COMMUNITY (specify town): City of Houston > 15 CONNECTIONS

☒ 3. SURFACE WATER ☒ 4. WELL

Continue On Page 9

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA (continued)

H. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/buildings)	4. NON-COMMUNITY (mark 'X')	5. COMMUNITY (mark 'X')
Bethel M.B. Church	Unknown	Bethel Missionary Baptist Chuch 2818 Exchange St., Houston, TX	X	
*At the time of the inspection, the Bethel Missionary Baptist Church was deserted. Post-inspection telephonic attempts to obtain inforamtion pertaining to this well have proved to be fruitless.				

I. RECEIVING WATER

1. NAME Hunting Bayou

☒ 2. SEWERS ☒ 3. STREAMS/RIVERS ☐ 4. LAKES/RESERVOIRS ☐ 5. OTHER (specify):

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS (Galveston Bay)

Contact Recreation
Non-Contact Recreation
Propagation of fish and Wildlife

XI. SOIL AND VEGITATION DATA

LOCATION OF SITE IS IN:

☐ A. KNOWN FAULT ZONE ☐ B. KARST ZONE ☐ C. 100 YEAR FLOOD PLAIN ☐ D. WETLAND

☐ E. A REGULATED FLOODWAY ☐ F. CRITICAL HABITAT ☐ G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

'X'	A. OVERBURDEN	'X'	B. BEDROCK (specify below)	'X'	C. OTHER (specify below)
	1. SAND				
X	2. CLAY	X	Beaumont Formation		
	3. GRAVEL				

XIII. SOIL PERMEABILITY

☐ A. UNKNOWN ☐ B. VERY HIGH (100,000 to 1000 cm/sec.) ☐ C. HIGH (1000 to 10 cm/sec.)
☐ D. MODERATE (10 to .1 cm/sec.) ☒ E. LOW (.1 to .001 cm/sec.) ☐ F. VERY LOW (.001 to .00001 cm/sec.)

G. RECHARGE AREA

☐ 1. YES ☒ 2. NO 3. COMMENTS:

H. DISCHARGE AREA

☐ 1. YES ☒ 2. NO 3. COMMENTS:

I. SLOPE

1. ESTIMATE % OF SLOPE: 0%

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC. Site was frequently submerged for days, before the present drainage system was constructed in 1971.

J. OTHER GEOLOGICAL DATA

Soil types are Lu (Lake Charles Urban) and Ur (Urban). Both have been treated with lime for stabilization, and covered with about 4"-6" of fill.

 Continue On Reverse

Continued From Front

XIV. PERMIT INFORMATION

List all applicable permits held by the site and provide the related information.

A. PERMIT TYPE (e.g., RCRA, State, NPDES, etc.)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (mo., day, & yr.)	E. EXPIRATION DATE (mo., day, & yr.)	F. IN COMPLIANCE (mark 'X')		
					1. YES	2. NO	3. UNKNOWN
Unpermitted							

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

☐ NONE ☒ YES (summarize in this space)

Original Olin Plant was cited for both air and water quality violations.

NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition *(Section II)* information on the first page of this form.

SOUTHERN PACIFIC RAILROAD COMPANY & MUSTANG INDUSTRIAL EQUIPMENT COMPANY

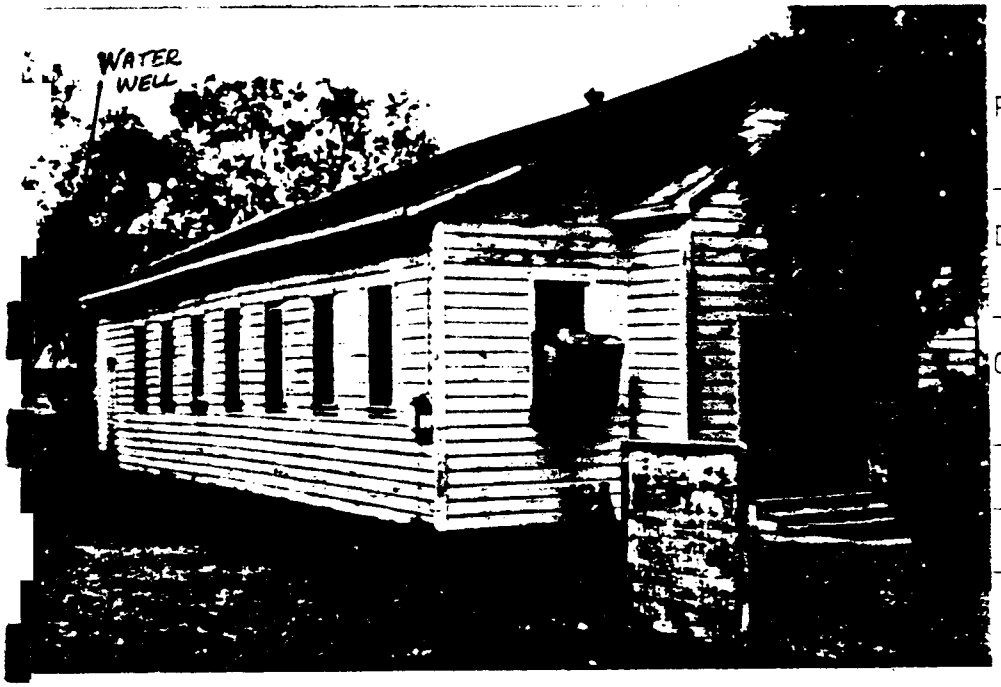
Photographer / Witness (1)

BILL CARROTHERS/HILLOL RAY

Date / Time / Direction

DEC. 4, 1980 / 1100 hrs. / SOUTH

Comments: Photograph of area between the Southern Pacific Railroad and the Northeast Corner of the Trailer Parking Ar



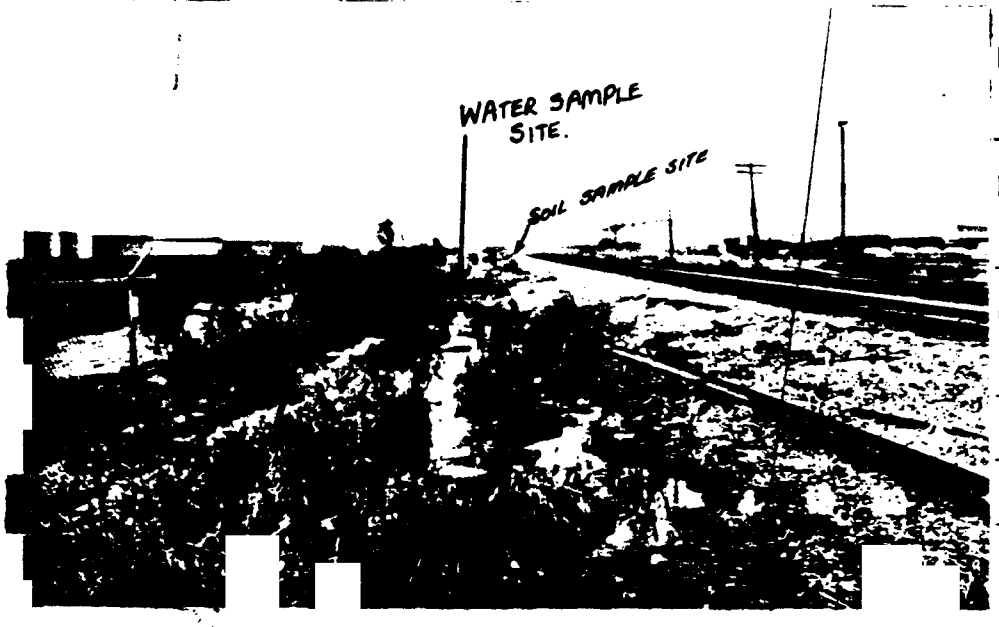
Photographer / Witness (2)

BILL CARROTHERS/HILLOL RAY

Date / Time / Direction

DEC. 4, 1980 / 1115 hrs. / WEST

Comments: BETHEL M.B. CHURCH. VEHICLES AND BUILDING IN BACKGROUND ARE PART OF MUSTANG INDUSTRIAL EQUIPMENT C.



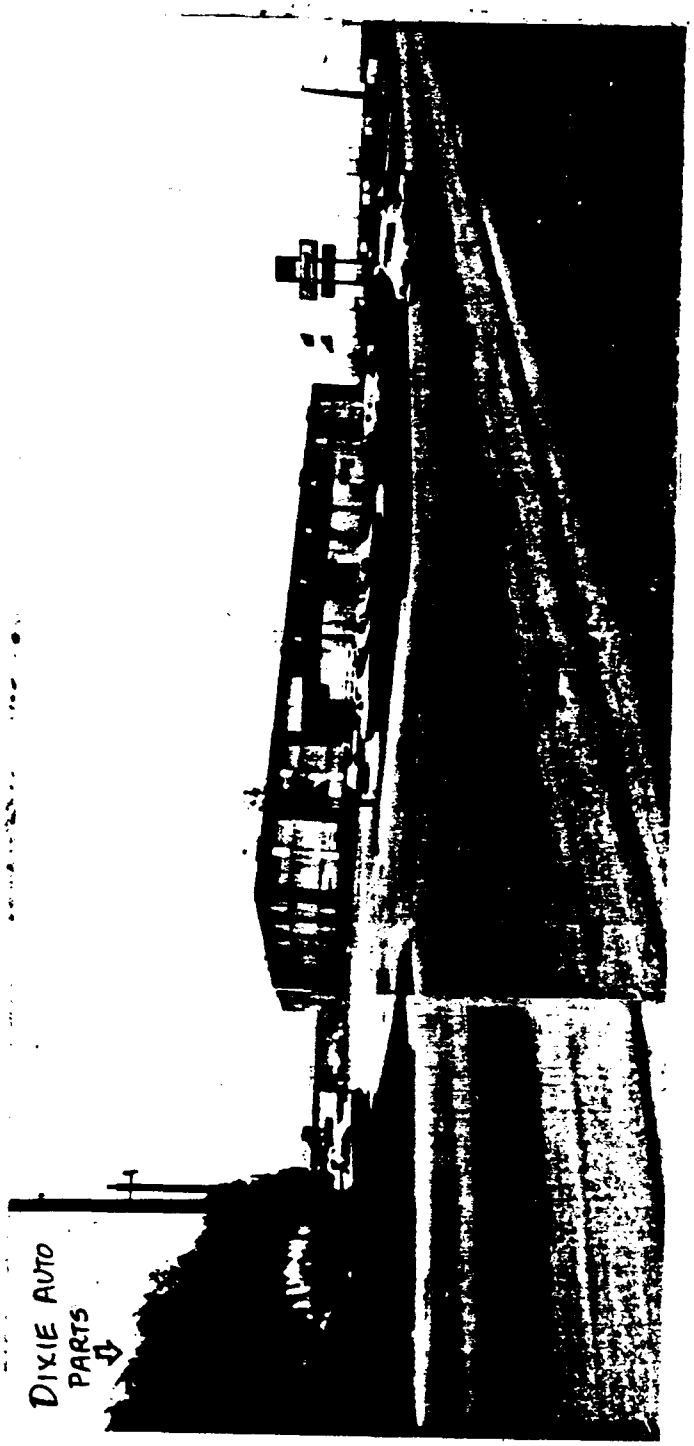
Photographer / Witness (3)

BILL CARROTHERS/HILLOL RAY

Date / Time / Direction

DEC. 4, 1980 / 1300 hrs. / NORTH

Comments: WATER SAMPLE WAS COLLECTED ABOUT 200 YARDS NORTH OF THE INTERSECTION OF WALLISVILLE ROAD AND THE RAILROAD TRACKS.



MUSTANG INDUSTRIAL EQUIPMENT COMPANY & S. P. OLIVER YARD, SOUTHERN PACIFIC R.R. COMPANY.

Photographer / Witness (4)

BILL CARROTHERS / HILLOL RAY

Date / Time / Direction

DEC. 4, 1980 / 1033 HRS. / NE

Comments: MUSTANG INDUSTRIAL EQUIPMENT COMPANY.

Photographer / Witness

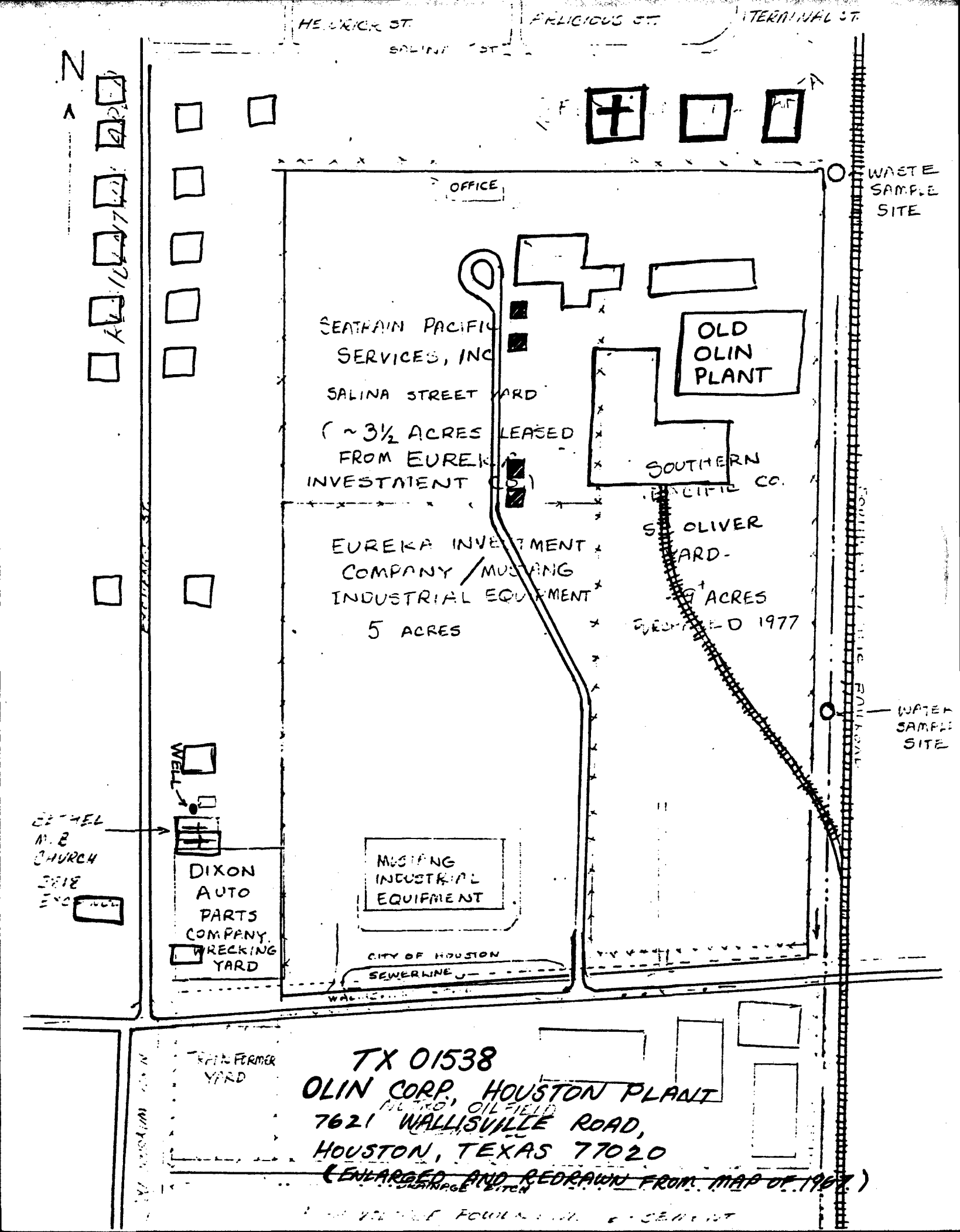
Date / Time / Direction

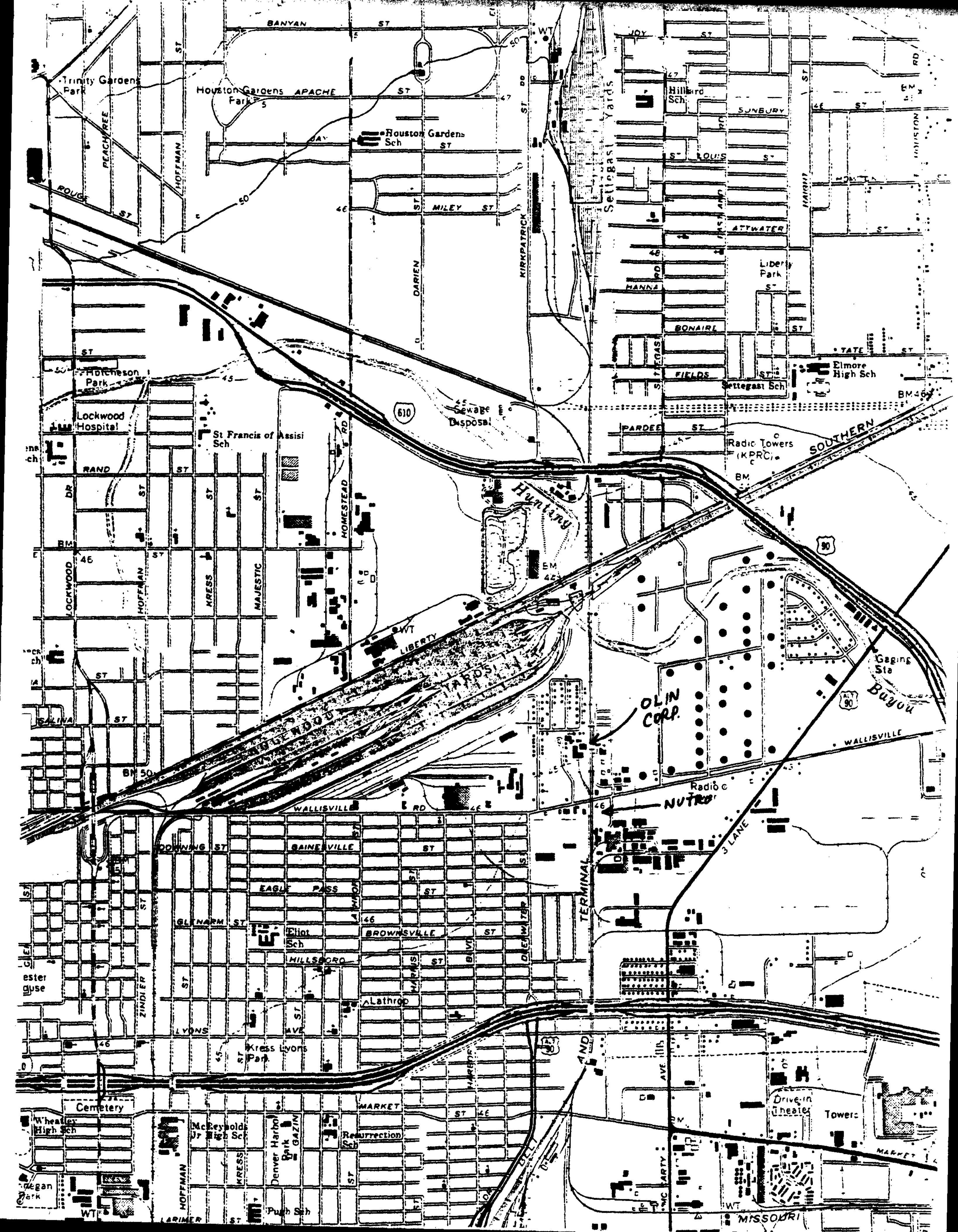
Comments:

Photographer / Witness

Date / Time / Direction

Comments:


N
HENDRICK ST.
DELICIOUS ST.
TERMINAL ST.
SALINA ST.
OFFICE
WASTE SAMPLE SITE
SEATRAIN PACIFIC SERVICES, INC
SALINA STREET YARD
(~3½ ACRES LEASED FROM EUREKA INVESTMENT CO.)
OLD OLIN PLANT
SOUTHERN PACIFIC CO.
ST. OLIVER YARD-
ACRES
LEASED 1977
EUREKA INVESTMENT COMPANY / MUSTANG INDUSTRIAL EQUIPMENT
5 ACRES
WATER SAMPLE SITE
WELL
BETHEL M.E. CHURCH
DIXON AUTO PARTS COMPANY WRECKING YARD
MUSTANG INDUSTRIAL EQUIPMENT
CITY OF HOUSTON SEWERLINE
TEXAS FARMER YARD
TX 01538
OLIN CORP., HOUSTON PLANT
ALTO OIL FIELD
7621 WALLISVILLE ROAD,
HOUSTON, TEXAS 77020
(ENLARGED AND REDRAWN FROM MAP OF 1967)


BANYAN ST
Trinity Gardens Park
Houston Gardens Park
APACHE ST
Houston Gardens Sch
PEACHTREE
HOFFMAN
ROUGE ST
MILEY ST
DARIEN
KIRKPATRICK
Settegast Yards
JOY ST
Hillard Sch
SUNBURY
ST LOUIS ST
ATTWATER
Liberty Park
HANNA
BONAIRE
TATE ST
Elmore High Sch
FIELDS
Settegast Sch
Hutcheson Park
Lockwood Hospital
610
Sewage Disposal
PARDEE ST
Radio Towers (KPRC)
SOUTHERN
St Francis of Assisi Sch
RAND ST
HOMESTEAD RD
Hunting
LOCKWOOD
KRESS
MAJESTIC
90
LIBERTY
ENGLEWOOD YARDS
Gaging Sta
Bayou
OLIN CORP.
WALLISVILLE
SALINA ST
WALLISVILLE RD
NUTRO
3 LANE
DOWNING ST
GAINESVILLE ST
EAGLE PASS ST
GLENARM ST
Eliot Sch
BROWNSVILLE ST
HILLSBORO
HARRIS ST
TERMINAL
Lathrop
ZINDLER
LYONS AVE
Kress Lyons Park
Cemetery
MARKET ST
Wheatley High Sch
McReynolds Jr High Sch
Denver Harbor Park
GAZIN
Resurrection Sch
Drive-in Theater
Towers
MARKET
BELT
MC CARTY
MISSOURI
Pugh Sch
LARIMER ST

REGION 6

[illegible] SURVEILLANCE AND ANALYSIS DIVISION
HOUSTON BRANCH-6608 Hornwood Drive
Houston, Texas 77074

Proj. No. | Project Name: OLIN PESTICIDE PLANT WALLISVILLE ROAD - HOUSTON, TX

SAMPLERS: (Signature) Bill Carrothers / [signature]

STA. #	SEQ. #	DATE	TIME	STATION LOCATION	1.Gen.Inorganics	2.Metals	3.Nutrients	4.Oil & Grease	5.Phenolics	6.Cyanide	7.Org.Characteris.	8.Volatile Organ.	9.General Organics	10.Tracer	11.Solids-Inorganic	12.Solids-Organic	13.Biol-Inorganic	14.Biol-Organics	15.Source Filter	16.Probe Wash	17.Impinger Catch	18.Ambient Filter	19.Solid Adsorbant	20.Ambient Impinger	21.Benthos	22.Bacteriology	23.Plankton	24.Chlorophyll	25.Pathogen.Bact.	26.Pesticides	27.Arsenic	28.	NUMBER OF CONTAINERS	REMARKS
1	001	Dec 4	1315	Ditch Adjacent to Olin.																										X	X		1	
2	002	Dec. 4	1310	" " " "																										X	X		1	

TOTAL NO. OF CONTAINERS

Relinquished by: (Sig.)	Date/Time	Received by: (Sig.)	Relinquished by: (Sig.)	Date/Time	Received by: (Sig.)
Bill Carrothers	12/4 1445 hrs.	M.D. Langley			
Relinquished by: (Sig.)	Date/Time	Received by: (Sig.)	Relinquished by: (Sig.)	Date/Time	Rec'd. by Courier (Sig.
Relinquished by Courier (Signature)	Date/Time	Received by Mobile Lab (Signature)	Relqshed by Mobile Lab (Signature)	Date/Time	Rec'd. by Courier (Sig. (Signature)
Method of Shipment:		Shipped by: (Signature)	Courier from Terminal (Signature)	Rec'd. for Lab. by: (Signature)	Date/Time

REFERENCE 2

Photographic Analysis of the Olin Hazardous Waste Site, Houston, Texas, prepared for EPA Region 6 by Environmental Monitoring Systems Laboratory, P. O. Box 15027, Las Vegas, NV 89114, TS-AMD-81051, June 1981.

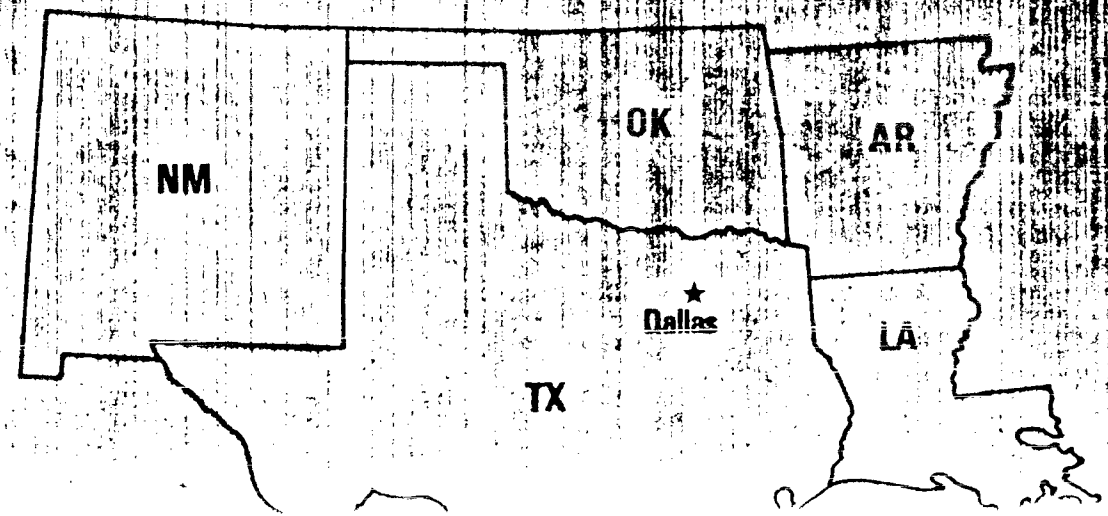
Environmental Protection Agency
Systems
P.O. Box 15027
Las Vegas, NV 89114

Research and Development

EPA

Photographic Analysis of the Olin Hazardous Waste Site Houston, Texas

prepared for
EPA, Region 6



TS-AMD-81053
June 1981

PHOTOGRAPHIC ANALYSIS OF THE OLIN HAZARDOUS WASTE SITE HOUSTON, TEXAS

by

J. S. Duggan
Environmental Programs
Lockheed Engineering and Management Services Company, Inc.
Las Vegas, Nevada 89114

Contract No. 68-03-3049

Project Officer

C. E. Lake
Advanced Monitoring Systems Division
Environmental Monitoring Systems Laboratory
Las Vegas, Nevada 89114

ENVIRONMENTAL MONITORING SYSTEMS LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
LAS VEGAS, NEVADA 89114

OLIN HAZARDOUS WAS
SHED
BUILDING
TANK
ROAD
WALLISVILLE ROAD

PHOTO ANALYSIS

1944 PHOTOGRAPHY

There has been a tremendous expansion of this site since the 1938 photography. At least nine buildings have been constructed with the largest being approximately 64 x 28 meters (210 x 92 feet). This building has a white powdery appearance as if fugitive dust from the facility operation has settled on it. Several other buildings and the ground around them also have this appearance. No major storage tanks are evident, but there are two small vertical tanks, of unidentified purpose, visible on the site. A small pond approximately 24 x 12 meters (80 x 40 feet) is evident near the west fence line and may contain liquid waste materials. In the northwest corner of the site a small pile of unidentified material is evident. There are no other indications of waste dump or burial activity at the site. There are four railroad box cars within the site and one outside the fence line.

Drainage continues toward the southeast; however, a drainage canal is now evident south of Wallisville Road.

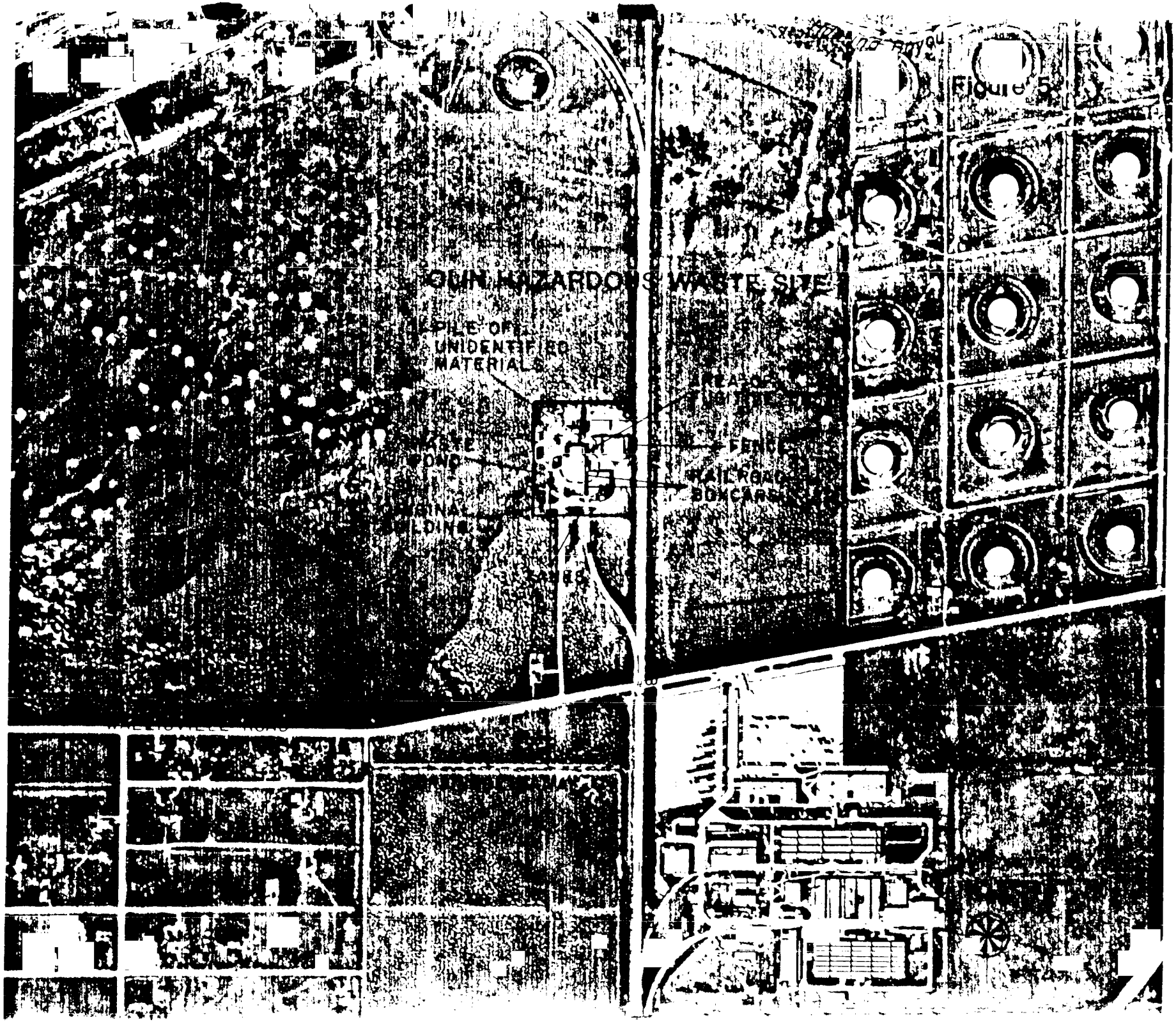

GUN HAZARDOUS WASTE SITE
PILE OF UNIDENTIFIED MATERIALS
FENCE
RAILROAD BOXCARS

Figure 5

PHOTO ANALYSIS

1953 PHOTOGRAPHY

The area around the site has undergone a tremendous development since 1944. To the west and north is a new housing development, while to the east and south there has been industrial development.

Some development has occurred within the site with the addition of two large buildings and several small buildings. The south fence line has moved 15 meters (50 feet) further south adding approximately 0.2 hectares (.5 acres) to the site. A new railroad spur has been added and serves the new buildings. At least eight box cars are visible in the site. In another development, an access road on the west side of the site leads to an apparent dump area. A small road leading from the housing area also provides access to the dump area, suggesting the local people may use this area for the disposal of domestic refuse. This dump area is approximately 69 x 38 meters (225 x 125 feet) in size.

A second dump area, approximately 69 x 32 meters (225 x 105 feet) is evident just outside the south fence line between the original rail spur and the main railroad line. As there are no access roads to this dump area, the only obvious source of waste materials would be from the railroad cars.

The area of fugitive dust appears to be much the same as in 1944, but the tone of the liquid in the waste pond has changed, suggesting a different material is being placed in the pond.

F
ST
NEW
INDUSTRIAL
DEVELOPMENT
DRAINAGE CANAL

PHOTO ANALYSIS

1957 PHOTOGRAPHY

The dump area on the west side appears to have expanded since 1953, but the homogeneous tone suggests it may be covered over with dirt. The same tone is evident on the dump area on the south side of the site. An expansion of the site has pushed into the south dump area, as the fence line has been moved approximately 30 meters (100 feet) to the south, adding 0.18 hectares (.46 acres) to the site. Three horizontal liquid storage tanks, each 10.5 meters (35 feet) long, have been added in this area of expansion. A containment dike around the tanks prevents any spillage from escaping.

To the north about half of one building has been removed, but nothing appears to have taken its place. Two small storage tanks are evident in the northwest section of the site. There does not appear to be any changes in the fugitive dust area or in the waste pond.

Several developments have occurred outside the site. The most prominent development is the tremendous expansion of the Inglewood Railroad yards, resulting in the loss of at least 11 homes in the housing area. Second, there are two large dump areas northeast of the Olin site. The largest measures approximately 110 x 84 meters (360 x 275 feet), and is connected via a dirt access road to the industrial development east of the Olin site.

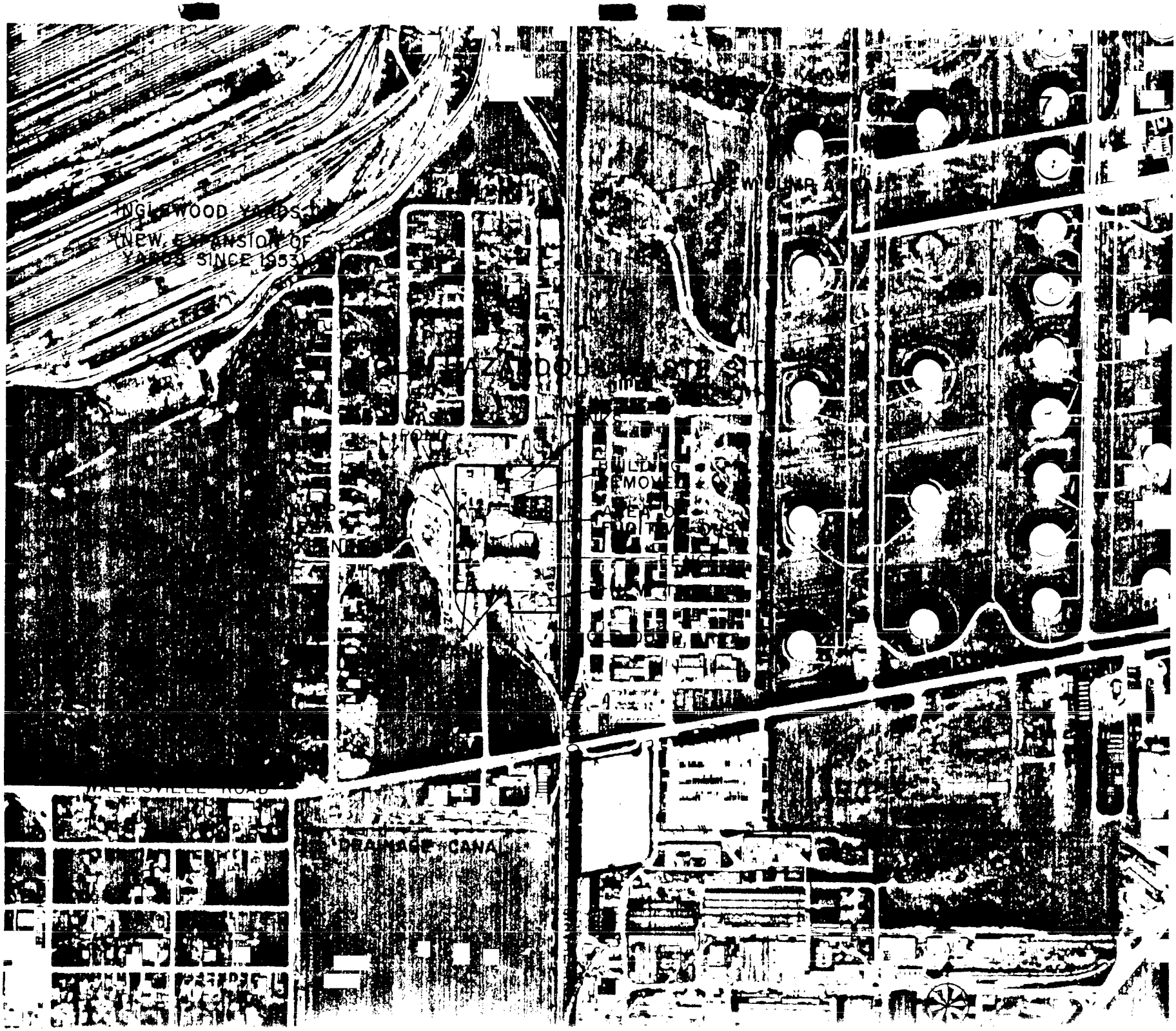

INGLEWOOD YARDS
NEW EXPANSION OF
YARDS SINCE 1953
MALLORY AVENUE
DRAINAGE CANAL

PHOTO ANALYSIS

1964 PHOTOGRAPHY

The 1964 photography reveals several important changes to the Olin site since 1957. The most obvious is the expansion of the site. The west fence line has been moved approximately 88 meters (288 feet) further west, increasing the area of the site by 1.2 hectares (3 acres). The total area of the site is now approximately 3.3 hectares (8.26 acres). A second very prominent feature is the addition of a waste pond, approximately 20 x 20 meters (66 x 66 feet), located in the middle of the old west dump area. A new dump area is now located approximately 24 meters (80 feet) northwest of the waste pond. Of less significance is the removal of the remaining portion of the building that was visible in 1957. The area of fugitive dust appears much the same and there are five box cars on the railspurs. Vegetation is returning to both of the old dump sites. There is no other evidence of waste burial or disposal.

Outside the site, several new features are present, the most prominent being the industrial development west of the Olin site. To the east the industrial area has had a slight expansion to the north and there are two new access roads to the nearby dump area. It would appear the dump area adjacent to Hunting Bayou is no longer in use, as there is no visible ground scars and the access road and the dump seems to be grown over with vegetation. Further toward the east, five large oil storage tanks have been removed.

DRAINAGE CANAL

PHOTO ANALYSIS

1973 PHOTOGRAPHY

Another change in the west fence line has occurred since 1964. The north corner has been moved 42 meters (138 feet) to the east, resulting in wedge of land apparently removed from the site. The fence line now passes through the middle of the dump noted in 1964. An unidentified clearing is visible approximately 25 meters (80 feet) southwest of the waste pond. There are no access roads to this area and no piles of material within the area. It appears to be barren land with all vegetation removed. The reasons or causes of this cannot be determined from aerial photography.

There are two piles of unidentified materials, one on the 1964 dump area and the second in the middle of the access road turnaround. The level of waste liquid in the west pond has been reduced since 1964, but the original pond continues to be full. There has been continued growth of vegetation in the old south dump area. The area with fugitive dust appears to have been reduced since 1964 and very few vehicles are visible within the site, indicating a possible change in status of this site.

Outside the site, a scrap metal facility is visible to the west of the Olin site. To the east, the industrial area has undergone more expansion and the associated dump area is at least twice the size it was in 1964.

A tank in the oil tank farm has had the top removed, and it appears both the top and the tank are damaged.

South of the Olin site across Wallisville Road, a new dump is now visible; however, the materials appear to be mostly construction rubble.

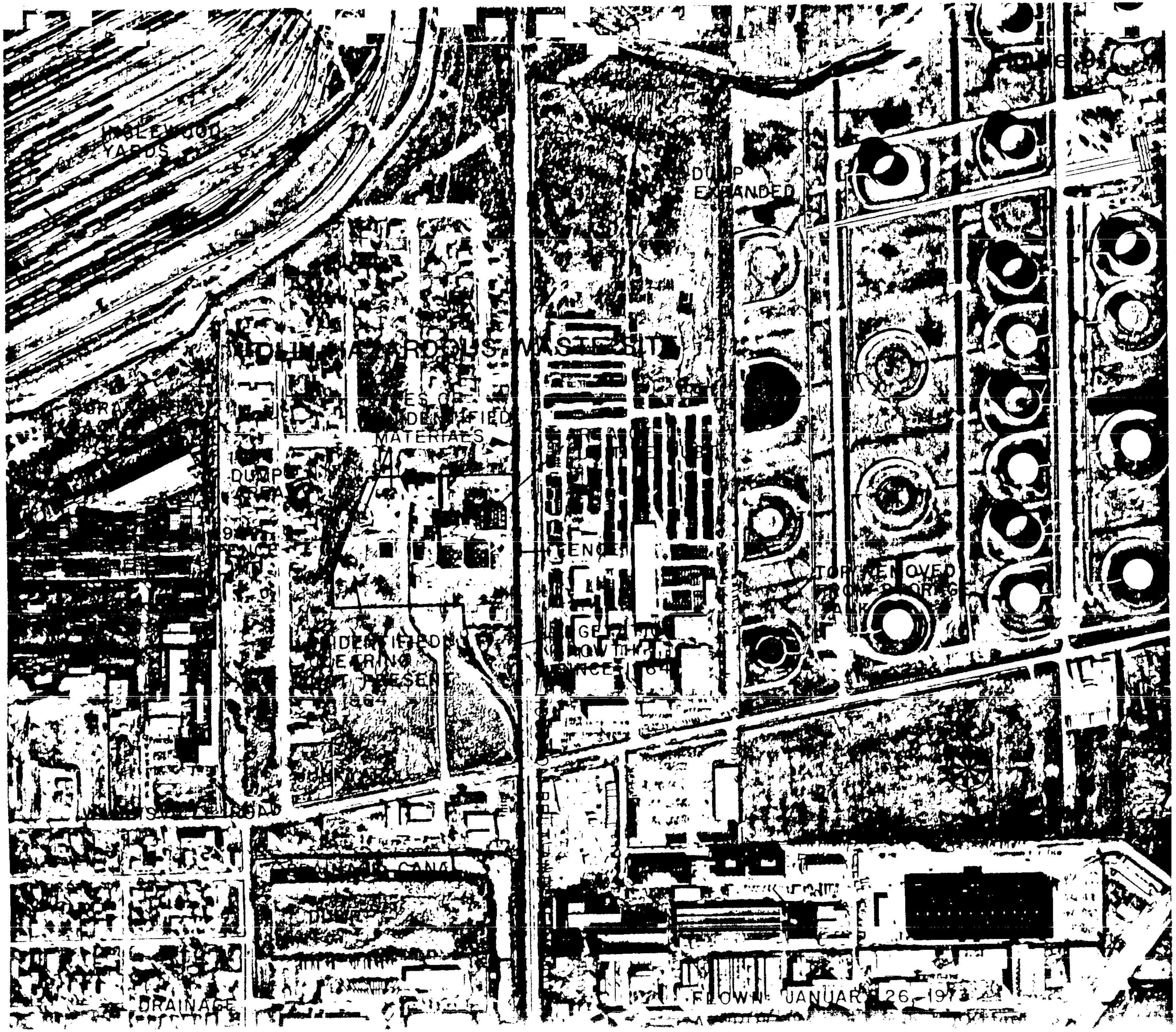
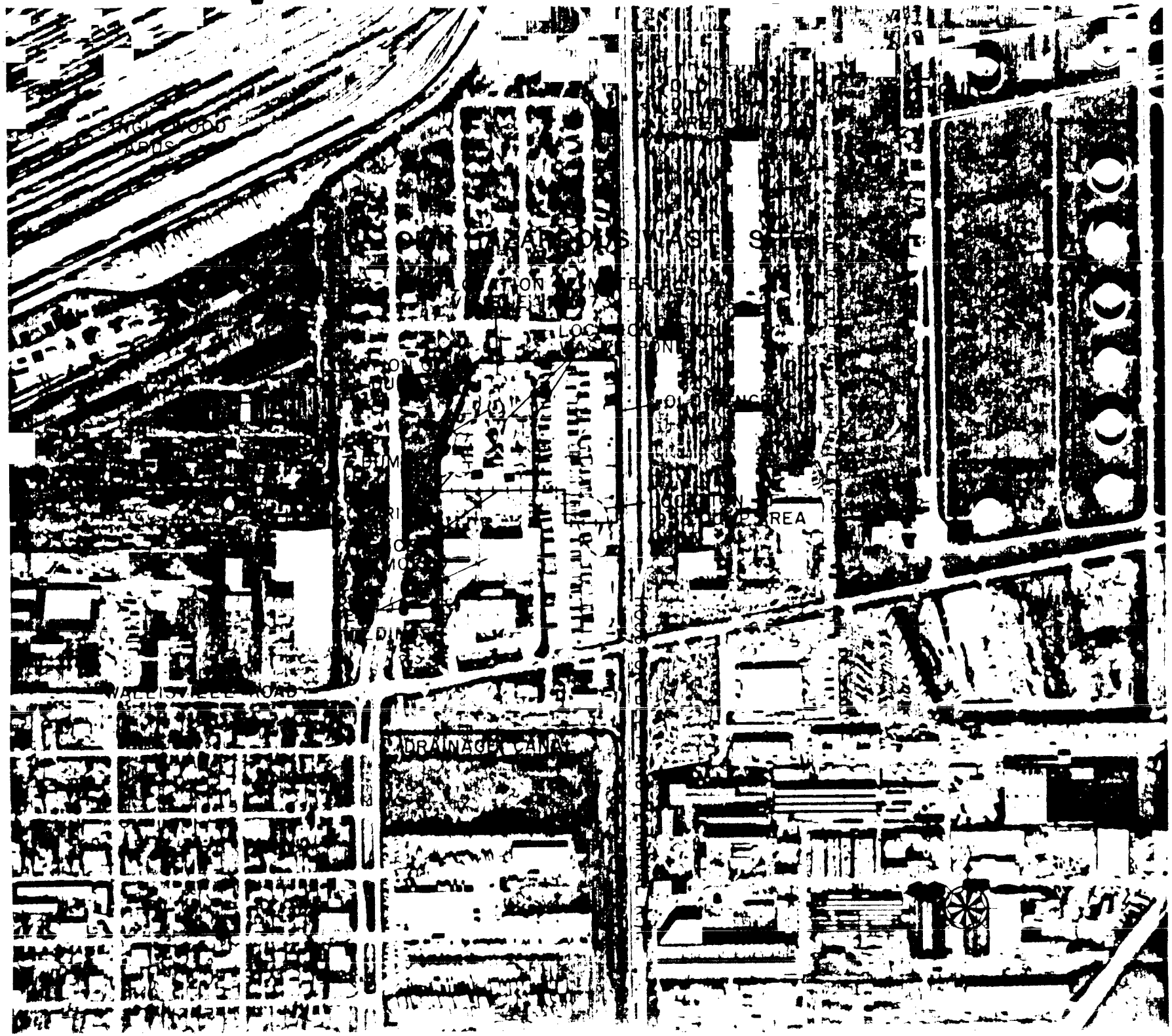

DUMP
MATERIALS
DRAINAGE

PHOTO ANALYSIS

1981 PHOTOGRAPHY

The 1981 photography reveals a tremendous change in the Olin site since 1973. All of the buildings, structures, and waste ponds associated with the site in 1973 have been removed. The site is now occupied by open storage yards, and there is no trace of the former Olin facility other than a partial fence line and a portion of a dump. It is obvious the buildings and railspurs were torn down, but there are no indications as to disposition of the remaining dumps and waste ponds. It is impossible to determine from the photography if the dump and waste ponds were completely removed or merely covered over by the new construction.

This status also applies to the dump located northeast of the Olin site. The 1981 photography reveals it also is no longer in existence. The expansion of the industrial facility either removed the dump or covered it over.


WALLISVILLE ROAD
DRAINAGE CANAL

REFERENCE 3

Foundation Investigation Mustang Tractor & Equipment Co. Wallisville Road Site, Houston, Texas, prepared for Ralph Miller, Architect, by Murillo Engineering & Testing Service, Inc., 5601 Bintliff Drive, Suite 550, Houston, Texas 77036, 105-74E, January 1974.

REPORT OF: FOUNDATION INVESTIGATION
MUSTANG TRACTOR & EQUIPMENT CO.
WALLISVILLE ROAD SITE
HOUSTON, TEXAS

REPORT NO.: 105-74E JANUARY 1974

REPORTED TO: RALPH MILLER
ARCHITECT
HOUSTON, TEXAS

INTRODUCTION

The study reported herein is an investigation of the subsurface conditions at the site of the proposed Mustang Tractor & Equipment Company facility to be located on Wallisville Road, approximately 500 feet east of its intersection with Wayside Drive, Houston, Texas.

AUTHORIZATION

The services performed were authorized verbally for Mustang Tractor & Equipment Company by Mr. Ralph Miller, Architect, on January 8, 1974.

SUBSURFACE EXPLORATION

Exploration at the site consisted of four (4) undisturbed sample core borings drillled to a depth of twenty (20) feet below existing ground surface. Location of the borings is shown on the attached Boring Plan.

The very wet surface conditions throughout the site caused by the recent rains required the use of a dozer to move the truck-mounted drilling rig and water truck to the boring location.

SUBSURFACE CONDITIONS

Specific type and condition of subsurface soils encountered at the site are shown on the individual Boring Logs. In general, the surface soils at the site are fairly uniform in their mode of occurrence. The surface soils are noted to be plastic dark gray and tan & gray clay which is classified as "CH" type soils which exhibit expansive characteristics when subjected to the normal Gulf Coast seasonal wetting and drying cycles.

Static water table was not found at the site during drilling operations, but is assumed to exist at a depth of approximately thirty (30) feet below existing ground surface.

DESIGN ANALYSIS

Foundation Type and Depth

Based on analysis of the boring logs, laboratory test results and engineering studies, it is our opinion that structural loads for the proposed facilities should be supported on square type spread footings extending to a depth of four (4) feet below existing surface.

It is recommended that at the four (4) foot depth, an allowable bearing capacity of 1,650 pounds per square foot for dead load or 2,500 pounds per square foot for total load, whichever is critical, should be used.

An analysis was made to determine if a higher unit loading could be used at the site. Since the soils encountered to the full depth explored consisted of plastic clays and sandy clays, it is our opinion that a higher unit load would not be available at the site within the depth explored.

Floor Slab and Grade Beams

It is recommended that a conventional concrete "slab-on-fill" be used for the interior portion of the structure planned at the site. The material used as select fill beneath the floor slab to reach plan grade should be a non-active sandy clay having a maximum Plasticity Index of 20. Prior to placement of any select fill, all vegetation at the site should be stripped.

General Area Paving

The subgrade soils at the site are dark gray clays of moderate Plasticity Index and will exhibit swell characteristics with changes in moisture content under pavements. In order to prevent these changes from occurring and to minimize maintenance, it is suggested that lime stabilization of the subgrade materials be carried out. The following

recommendations are given for paving at the site if lime stabilization is considered.

Type Pavement	Light Traffic	Heavy Traffic
Asphaltic Concrete	1½"	2"
Limestone Base	6"	8"
Lime Stabilized Subgrade	6"	6"

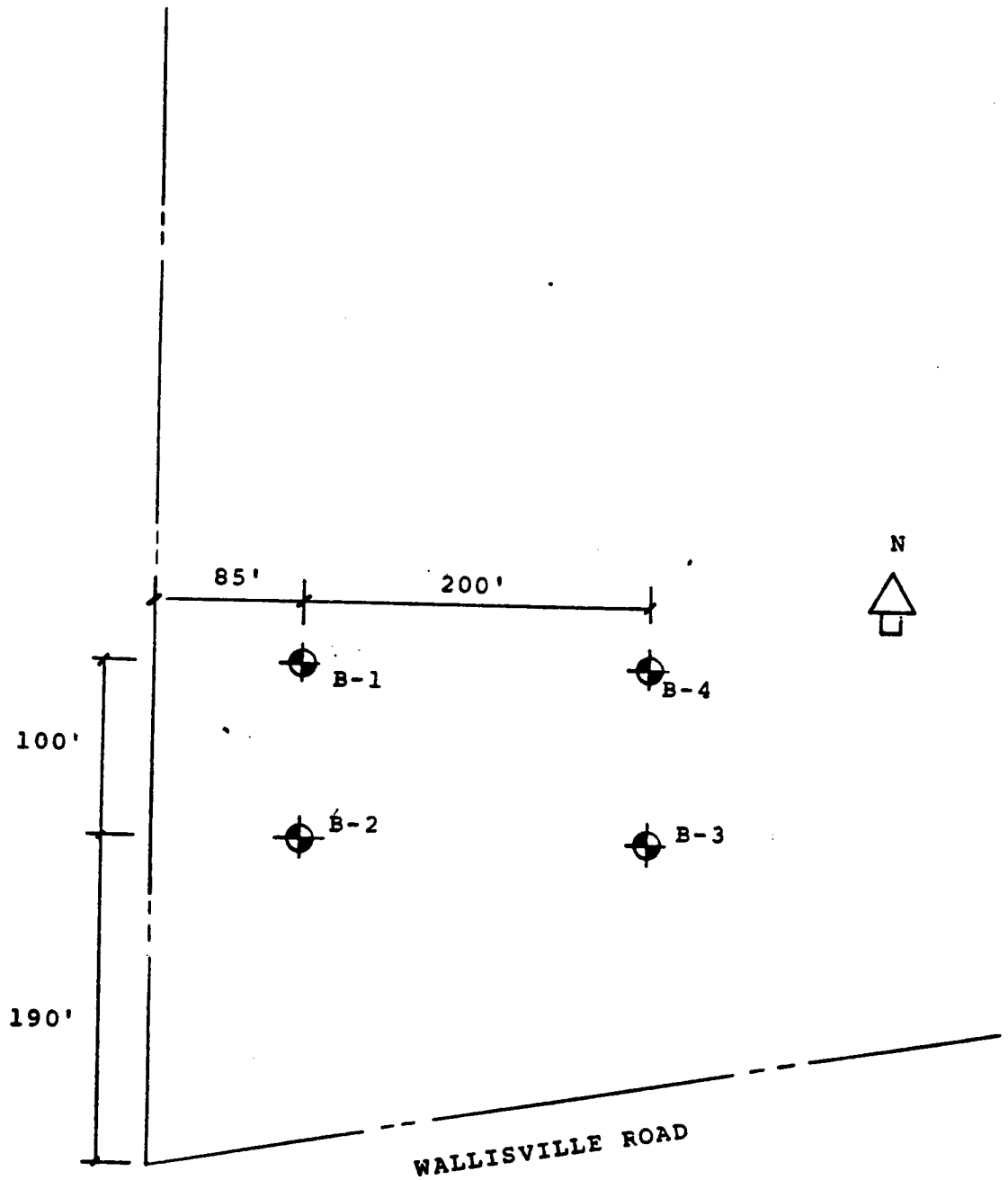
Subgrade preparation should consist of scarifying to a depth of six (6) inches and stabilizing with 22 pounds of hydrated lime per square yard. The soil lime mixture should be compacted to a minimum of 95% of Standard Proctor Density (ASTM D-698). Lime stabilization should conform to Texas Highway Department 1972 Standard Specification Item 260.

The base material should be compacted to 95% of the maximum dry unit weight as obtained in the laboratory by means of ASTM D-1557 procedure.

The surface of the compacted limestone base should then be primed with 0.20 gallons per square yard of MC-1 cut back asphalt. Hot mix asphaltic concrete should be in accordance with Texas Highway Department Item 340 Type D Modified.

J. Ray Murillo, P.E.
January 28, 1974

Copies Submitted:
Ralph Miller (1)
Karl Krause (1)
Chas. Gress-Mustang (2)
Invoice (1)
File (1)



BORING PLAN

JANUARY 1974

murillo engineering & testing service, inc.
8801 BINTLIFF DRIVE, SUITE 580 • (713) 782-0580 • HOUSTON, TEXAS 77036

SUMMARY OF LABORATORY TEST DATA

PROJECT MUSTANG TRACTOR

BORING NUMBER	DEPTH IN FEET	MOISTURE, %	DRY DENSITY, PCF	COMPRESSION, TSF	STRAIN, %	TYPE FAILURE	LAT. PRESSURE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SIEVE (-No.200)	CONSOLIDATION	SWELL, %
B-1	0-2	11						52	24	28			
	4-6	26	93	0.76									
	6-8	26	96	1.12									
	8-10	25	97	0.76				64	25	39			
B-2	6-8	13	104	0.82									
	8-10	28	95	0.81									
	13-15	16	108	0.26									
B-3	4-6	31	87	0.42				57	19	38			
	8-10	31	94	0.75									
	18-20	23	104	0.79				31	18	13			
B-4	2-4	28	92	0.65				57	25	32			
	8-10	22	98	0.49									
	13-15	29	97	0.70				31	16	15			

murillo engineering & testing service, inc.
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PROJECT MUSTANG TRACTOR BORING NO B-1

N = NO RECOVERY
C = UNDISTURBED CORE
P = PENETRATION TEST
J = JAR

DATE 1-22-74
LOCATION See Plan
ELEVATION
BORING TYPE 3" Core

DEPTH IN FEET	SAMPLE TYPE	PENETROMETER READING, SF	BLOWS/ FOOT	DESCRIPTION OF STRATUM
0	C	1.5		Plastic dark gray clay w/organic
	C	1.5		
5	C	1.5		Plastic tan and gray clay w/calcareous nodules
	C	1.5		
	C	1.5		Stiff tan and gray clay w/calcareous nodules
10				Stiff red and gray clay w/calcareous nodules
				Plastic tan and gray sandy clay w/sand seams
15	C	1.5		
	C	1.5		
20				Bottom @ 20 ft.

Note: Advanced boring to 20 feet without using drilling fluid; no water encountered.

murillo engineering & testing service, inc.
8801 BINTLIFF DRIVE, SUITE 550 • (713) 782-0590 • HOUSTON, TEXAS 77036

PROJECT MUSTANG TRACTOR BORING NO B-2

N = NO RECOVERY
C = UNDISTURBED CORE
P = PENETRATION TEST
J = JAR

DATE 1-22-74
LOCATION See Plan
ELEVATION
BORING TYPE 3" Core

DEPTH IN FEET	SAMPLE TYPE	PENETROMETER READING, SF	BLOWS/ FOOT	DESCRIPTION OF STRATUM
0	C	1.5		Plastic dark gray clay w/organic
	C	1.5		
5	C	1.5		Plastic tan and gray clay w/calcareous nodules
	C	1.5		
	C	1.5		
10				Plastic tan and gray sandy clay w/silt seams
15	C	1.5		Plastic tan and gray sandy clay w/calcareous nodules
20	C	1.5		

Bottom @ 20 ft.

Note: Advanced boring to 20 feet without using drilling fluid; no water encountered.

murillo engineering & testing service, inc.
6901 BINTLIFF DRIVE, SUITE 550 • (713) 782-0590 • HOUSTON, TEXAS 77036

PROJECT MUSTANG TRACTOR BORING NO B-3

N = NO RECOVERY
C = UNDISTURBED CORE
P = PENETRATION TEST
J = JAR

DATE 1-22-74
LOCATION See Plan
ELEVATION
BORING TYPE 3" Core

DEPTH IN FEET	SAMPLE TYPE	PENETROMETER READING, SF	BLOWS/ FOOT	DESCRIPTION OF STRATUM
0	C	1.5		Plastic dark gray clay w/organic
	C	1.5		
5	C	1.5		Plastic tan and gray clay w/calcareous nodules
	C	1.5		
	C	1.5		
10				Plastic tan and gray sandy clay w/silt seams
	C	1.5		
15				Plastic tan and gray sandy clay w/calcareous nodules
	C	1.5		
20				Bottom @ 20 ft.

Note: Advanced boring to 20 feet without using drilling fluid; no water encountered.

murillo engineering & testing service, inc.
6801 BINTLIFF DRIVE, SUITE 560 • (713) 782-0880 • HOUSTON, TEXAS 77036

PROJECT MUSTANG TRACTOR BORING NO B-4

N = NO RECOVERY
C = UNDISTURBED CORE
P = PENETRATION TEST
J = JAR

DATE 1-22-74
LOCATION See Plan
ELEVATION
BORING TYPE 3" Core

DEPTH IN FEET	SAMPLE TYPE	PENETROMETER READING, SF	BLOWS/ FOOT	DESCRIPTION OF STRATUM
0	C	1.5		Plastic dark gray clay w/organic
	C	1.5		
5	C	1.5		Plastic tan and gray clay w/calcareous nodules
	C	1.5		
	C	1.5		
10				Plastic tan and gray sandy clay w/sand seams
15	C	1.5		Plastic tan and gray sandy clay w/calcareous nodules
	C	15.		
20				Bottom @ 20 ft.

Note: Advanced boring to 20 feet without using drilling fluid; no water encountered.

REFERENCE 4

EPA Form 8900-1, Notification of Hazardous Waste Site, prepared by Verrill M. Norwood, Jr., Director, Environmental Affairs, Olin Corporation, P. O. Box 248, Charleston, TN 37310, 29 May 1981.

EPA Notification of Hazardous Waste Site

TXD000-001-257 000615

SE 6

(4)

United States Environmental Protection Agency Washington, DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

JUN 19 1981

6AEP

A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

TXD 00 - 060 - 7028

Name: Olin Corporation

Street: 120 Long Ridge Road

City: Stamford State: CT Zip Code: 06904

B Site Location:

~~TXD98-062-5537~~ Olin Corporation

Enter the common name (if known) and actual location of the site.

HAZ-TX015338

Name of Site: Houston Plant - Plant Site

Street: 7621 Wallisville Road

City: Houston County: Harris State: TX Zip Code: 77002

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Brown, J.C., Mgr. Environmental Technology

Phone: 615/336-2251 Ext. 3308

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year) To (Year)

Facility operated 1938-1972

E Waste Type: Choose the option you prefer to complete

Option 1: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☐ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☐ Other (Specify)

_____

_____

_____

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

_____

_____

_____

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

U129 Lindane		
P037 Dieldrin		
P004 Aldrin		
U061 DDT		
U036 chlordane		
P059 Heptachlor		
P123 Toxaphene		
P089 Parathion		

Form Approved
OMB No. 2000-0138

EPA Form 8900-1

Notification of Hazardous Waste S[illegible] — Side Two

F Waste Quantity:

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

* Unknown but believed to be a very small quantity.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. ☒ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount

cubic feet: Unknown *

gallons: _____

Total Facility Area

square feet: ~ 900

acres: _____

G Known, Suspected or Likely Releases to the Environment:

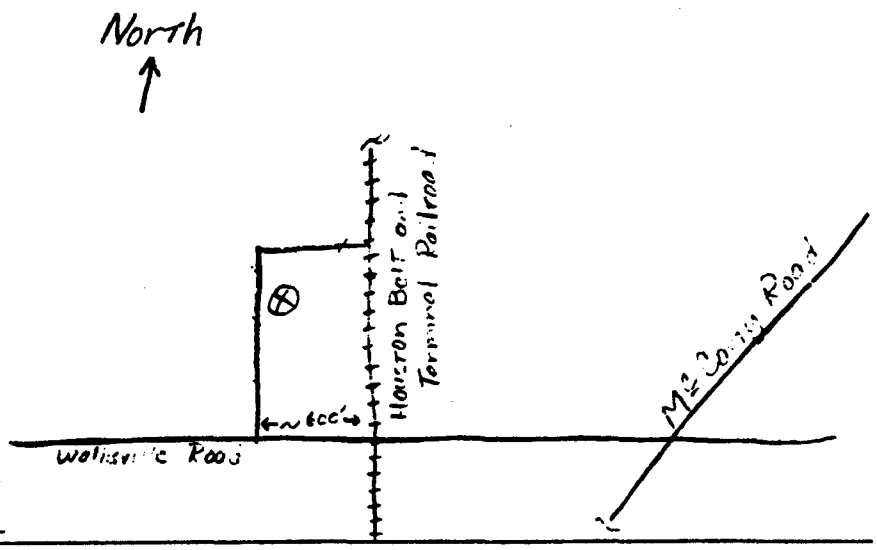
Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☐ Likely ☒ None

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.



Not to scale

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

A pit approximately 30 feet square was used to dispose of an unknown amount waste pesticide dusts. The site is now covered by a paved parking lot/freight truck staging facility.

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required to notify check "Other".

Name: Verrill M. Norwood, Jr.
Director, Environmental Affairs

Street: P.O. Box 248

City: Charleston State: TN Zip Code: 37310

Signature: Verrill M. Norwood Jr. Date: 7/29/81

☐ Owner, Present
☒ Owner, Past
☐ Transporter
☐ Operator, Present
☒ Operator, Past
☐ Other

REFERENCE 5

EPA Form T2070-2, Potential Hazardous Waste Site Identification and Preliminary Assessment, prepared by Bill Carrothers, FIT Chemist, Ecology & Environment, Inc., 17 December 1980.

EPA

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION	SITE NUMBER (to be assigned by Hq)
VI	TX 1538

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II *(Preliminary Assessment)*. File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME OLIVER YARD (So. Pacific Trans.Co.) & MUSTANG INDUSTRIAL EQUIPMENT CO. (Formerly Olin-Houston Chemical Co.)

B. STREET *(or other identifier)* 7600 Wallisville Road

C. CITY HOUSTON

D. STATE TX

E. ZIP CODE 77020

F. COUNTY NAME Harris

G. OWNER/OPERATOR *(If known)*

1. NAME: S. P. Oliver Yard - Mr. Dan Novasad, Manager
Mustang Ind. Eq. Co. - Mr. Chuck Chalker, Property Manager

2. TELEPHONE NUMBER: (713)223-6591
(713)460-2000

H. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION The former site of Olin Corp. Pesticide Formulating Plant, which made cotton dusts containing sulfur, DDT, toxaphene, aldrin, dieldrin, and other pesticides. (Continued on attached sheet.)

J. HOW IDENTIFIED *(i.e., citizen's complaints, OSHA citations, etc.)*
Eckhardt List, TX 395/5 ES 2985

K. DATE IDENTIFIED *(mo., day, & yr.)*
11/20/80

L. PRINCIPAL STATE CONTACT

1. NAME: Mr. Clarence Johnston, TDWR, Deer Park, TX

2. TELEPHONE NUMBER: (713)479-5981

II. PRELIMINARY ASSESSMENT *(complete this section last)*

A. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION

☐ 1. NO ACTION NEEDED *(no hazard)*

☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR: _____
b. WILL BE PERFORMED BY: _____

☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR: _____
b. WILL BE PERFORMED BY: _____

☒ 4. SITE INSPECTION NEEDED *(low priority)*

(This updates EPA Form 2070-2 previously submitted on September 24, 1980.)

C. PREPARER INFORMATION

1. NAME: Bill Carrothers
Bill Carrothers

2. TELEPHONE NUMBER: (214)742-4522

3. DATE *(mo., day, & yr.)*: Dec. 17, 1980

III. SITE INFORMATION

A. SITE STATUS

☐ 1. ACTIVE *(Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if intrequently.)*

☒ 2. INACTIVE *(Those sites which no longer receive wastes.)*

☐ 3. OTHER *(specify)*: _____ *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?

☒ 1. NO ☐ 2. YES *(specify generator's four-digit SIC Code)*: _____

C. AREA OF SITE *(in acres)*: 14

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES

1. LATITUDE *(deg.-min.-sec.)*: 29° 47' 20" N

2. LONGITUDE *(deg.-min.-sec.)*: 95° 17' 20" W

E. ARE THERE BUILDINGS ON THE SITE?

☐ 1. NO ☒ 2. YES *(specify)*: 3 permanent, several temporary.

Continue On Reverse

Continued From Front

IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

S. P. Oliver - parking site for flatbed truck trailers
Mustang - sales and repair of caterpilar lift trucks
Seatrain Pacific - storage yard for shipping containers

V. WASTE RELATED INFORMATION

A. WASTE TYPE

[ ] 1. UNKNOWN [ ] 2. LIQUID [X] 3. SOLID [ ] 4. SLUDGE [ ] 5. GAS

B. WASTE CHARACTERISTICS

[ ] 1. UNKNOWN [ ] 2. CORROSIVE [ ] 3. IGNITABLE [ ] 4. RADIOACTIVE [ ] 5. HIGHLY VOLATILE
[X] 6. TOXIC [ ] 7. REACTIVE [ ] 8. INERT [X] 9. FLAMMABLE

[ ] 10. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

Only known records are water analyses made by TDWR and the Eckhardt Report.

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT: 50	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE: lbs.	UNIT OF MEASURE	UNIT OF MEASURE
[ ] (1) PAINT, PIGMENTS	[ ] (1) OILY WASTES	[ ] (1) HALOGENATED SOLVENTS	[ ] (1) ACIDS	[ ] (1) FLYASH	[ ] (1) LABORATORY PHARMACEUT.
[ ] (2) METALS SLUDGES	[ ] (2) OTHER (specify):	[ ] (2) NON-HALOGNTD. SOLVENTS	[ ] (2) PICKLING LIQUORS	[ ] (2) ASBESTOS	[ ] (2) HOSPITAL
[ ] (3) POTW		[ ] (3) OTHER (specify):	[ ] (3) CAUSTICS	[ ] (3) MILLING/ MINE TAILINGS	[ ] (3) RADIOACTIVE
[ ] (4) ALUMINUM SLUDGE			[X] (4) PESTICIDES	[ ] (4) FERROUS SMLTG. WASTES	[ ] (4) MUNICIPAL
[ ] (5) OTHER (specify):			[ ] (5) DYES/INKS	[ ] (5) NON-FERROUS SMLTG. WASTES	[ ] (5) OTHER (specify):
			[ ] (6) CYANIDE	[ ] (6) OTHER (specify):	
			[ ] (7) PHENOLS		
			[ ] (8) HALOGENS		
			[ ] (9) PCB		
			[ ] (10) METALS		
			[ ] (11) OTHER (specify)		

Continue On Page 3

Continued From Page 2

V. WASTE RELATED INFORMATION *(continued)*

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE *(place in descending order of hazard)*.

1. Aldrin
2. Dieldrin
3. Toxaphene
4. DDT
5. BHC (Lindane)
6. Heptachlor
7. Sevin

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

According to Mr. Chalker, the old foundations of the Olin Plant were demolished, and about four inches of fill dirt were spread over the entire 18 acre site.

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD *(mark 'X')*	C. ALLEGED INCIDENT *(mark 'X')*	D. DATE OF INCIDENT *(mo., day, yr.)*	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER				
8. CONTAMINATION OF SURFACE WATER	X			Possible because of runoff observed during inspection.
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL	X			Piles of unknown chemicals observed in railroad right-of-way during inspection.
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER *(specify)*:				

Continue On Reverse

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

☐ 1. NPDES PERMIT ☐ 2. SPCC PLAN ☐ 3. STATE PERMIT (specify): _____
☐ 4. AIR PERMITS ☐ 5. LOCAL PERMIT ☐ 6. RCRA TRANSPORTER
☐ 7. RCRA STORER ☐ 8. RCRA TREATER ☐ 9. RCRA DISPOSER
☐ 10. OTHER (specify): NONE

B. IN COMPLIANCE? N/A
☐ 1. YES ☐ 2. NO ☐ 3. UNKNOWN

4. WITH RESPECT TO (list regulation name & number): _____

VIII. PAST REGULATORY ACTIONS

☐ A. NONE ☒ B. YES (summarize below)

Olin Corp. was found to be the source of both air and water quality violations in the late 1960's.

IX. INSPECTION ACTIVITY (past or on-going)

☐ A. NONE ☒ B. YES (complete items 1,2,3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
Off-site inspection	Dec.4, 1980	EPA & State	Located piles believed to be old insecticide.

X. REMEDIAL ACTIVITY (past or on-going)

☒ A. NONE ☐ B. YES (complete items 1, 2, 3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION

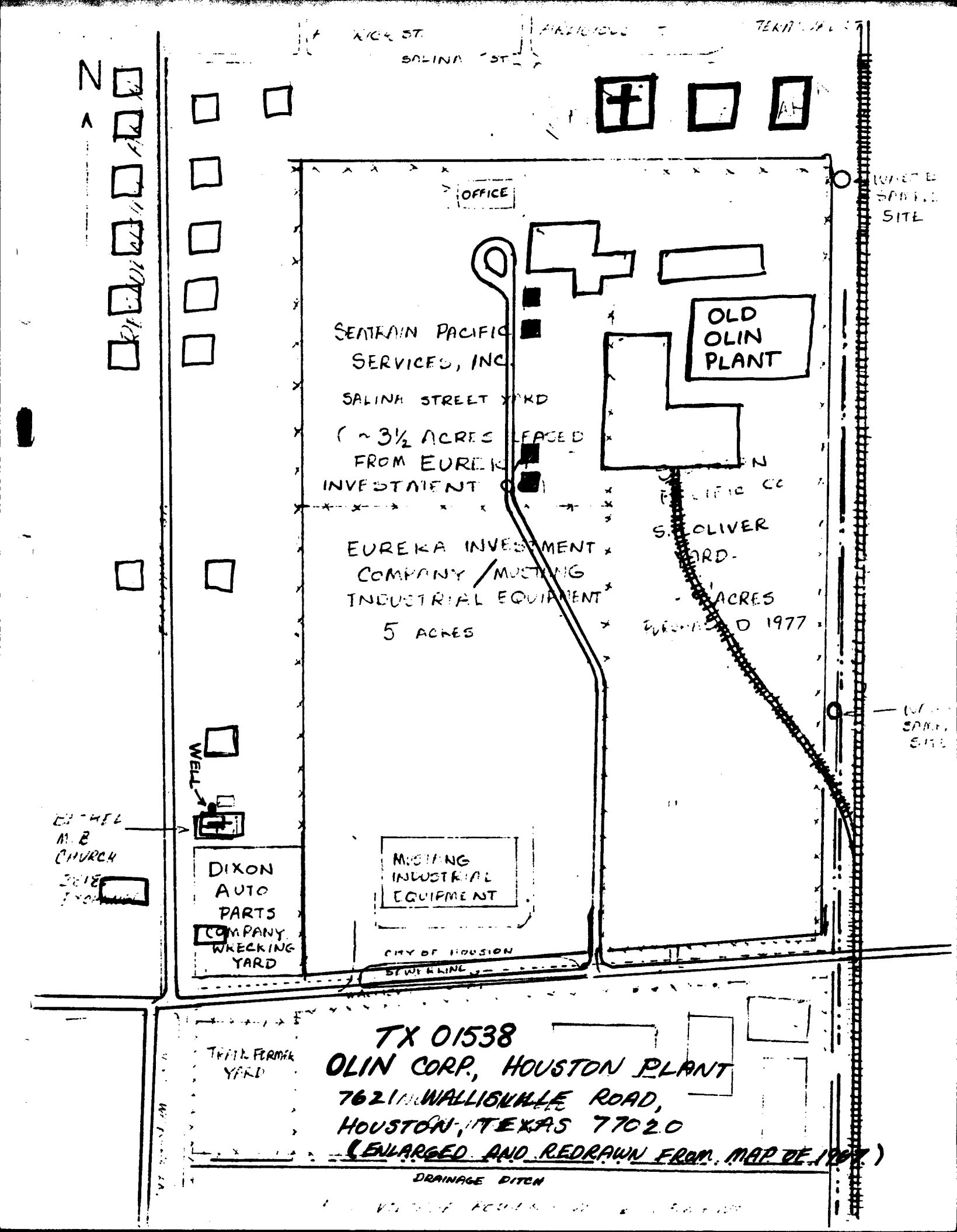
NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment (Section II) information on the first page of this form.

ATTACHMENT A

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT SUPPLEMENT SHEET

Instruction - This sheet is provided to give additional information in explanation of a question on the form T2070- 2.

Corresponding number on form	Additional Remark and/or Explanation
1.I.	TX 1538, the Wallisville Road Site of the Olin Corporation, consists of approximately eighteen acres that have been subsequently purchased by the Eureka Investment Company, and divided into three separate properties. The Eastern nine acres, plus a small corrider allowing access to the western boundary, was purchased from Eureka in 1977 by the Southern Pacific Railroad Company. The south five acres of the remaining property is the home of Mustang Industrial Equipment Company, while the remaining northwest portion has been leased to Seatrain Pacific Services, Inc., a containerized freight handling firm. Drainage from most of this property flows south and east toward a ditch adjacent to the Southern Pacific Railroad, and then under Wallisville Road past TX 6076, NUTRO Products Corporation.



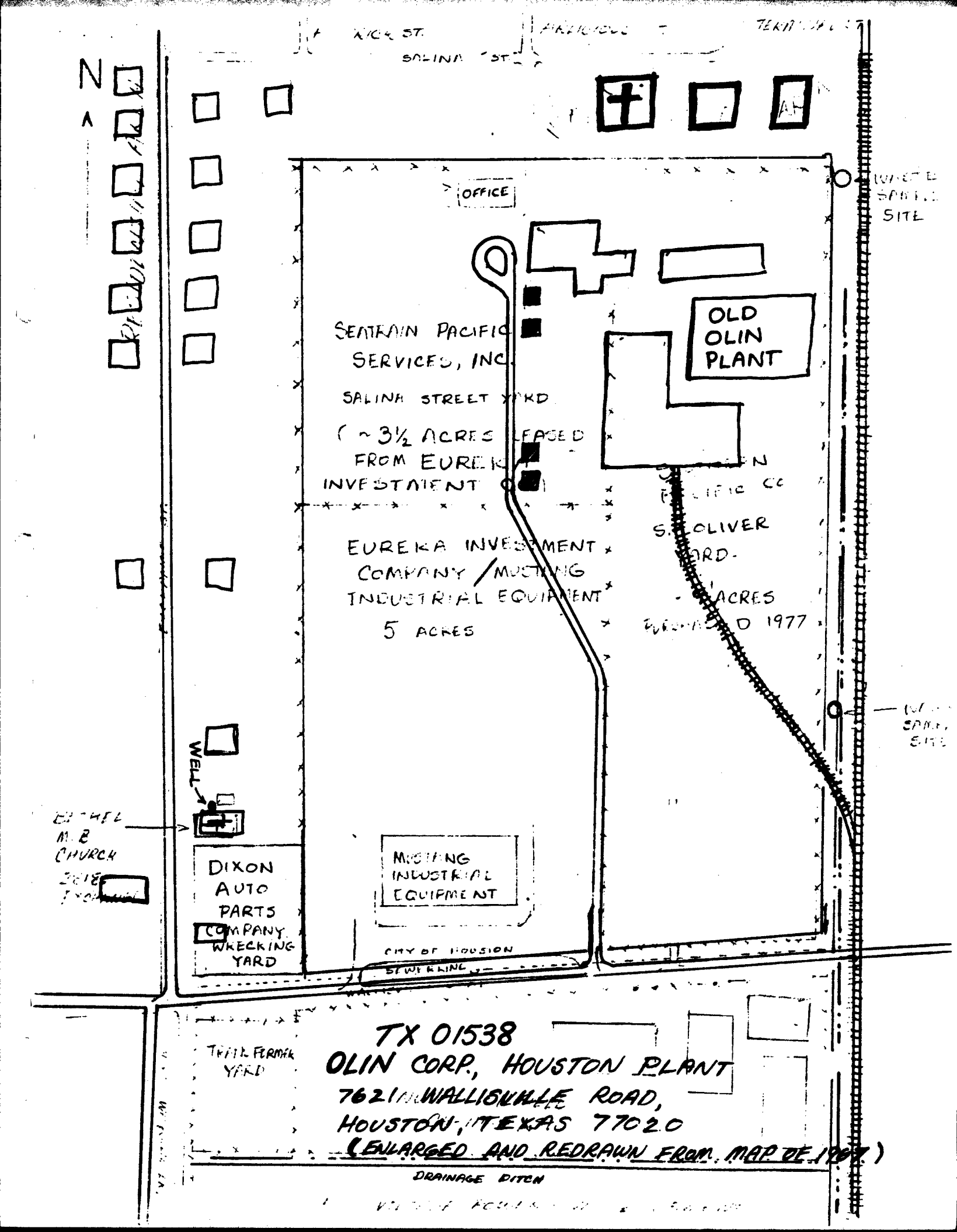
TX 01538

OLIN CORP., HOUSTON PLANT

7621 WALLISVILLE ROAD,

HOUSTON, TEXAS 77020

(ENLARGED AND REDRAWN FROM MAP OF 1967)



TX 01538

OLIN CORP., HOUSTON PLANT

7621 WALLISVILLE ROAD,
HOUSTON, TEXAS 77020

(ENLARGED AND REDRAWN FROM MAP OF 1967)

REFERENCE 6

EPA Form T2070-3, Site Inspection Report, prepared by Bill Carrothers, FIT Chemist, Ecology & Environment, Inc., 29 December 1980.

ABSTRACT

Through the Uncontrolled Hazardous Waste Site Investigation Program, Environmental Protection Agency, Region VI, and the Hazardous Site Control Division in Headquarters have requested the Environmental Monitoring Systems Laboratory in Las Vegas conduct a photo analysis of a potential hazardous waste site in Houston, Texas. Region VI reports the site, formerly owned and operated by Olin Corporation, was engaged in the production of pesticides. Aerial photographs from the years 1930, 1938, 1944, 1953, 1957, 1964, 1973, ans 1981, were analyzed to determine past operational practices, possible waste burials, and surface drainage. Analysis revealed development of the Olin site probably did not begin until sometime in 1938. Between then and 1973, the site underwent various changes with the addition of new buildings, rail spurs, and surface dumps, but the basic structure and apparent purpose of the facility did not change. The 1981 photography however, reveals the entire Olin facility had been removed and a new industrial facility now occupies the site.

CONTENTS

FIGURES

INTRODUCTION

Through the Uncontrolled Hazardous Waste Site Investigation Program, Environmental Protection Agency, Region VI, and the Hazardous Site Control Division in Headquarters have requested the Environmental Monitoring Systems Laboratory in Las Vegas to conduct a photo analysis of a potential hazardous waste site located in Houston, Texas (Figure 1). EPA Region VI reports this site, formerly owned and operated by Olin Corporation, had been engaged in the production of pesticides.

The Olin site occupies aproximately 3.3 hectares (8.26 acres) near the Inglewood Railroad Yards in Houston, Texas (Figure 2). Currently the site is occupied by several facilities, none of which appear to be involved with pesticide production. No traces of the old Olin facilities are evident in 1981. The major concern is that hazardous wastes (from the pesticide production) which may have been buried on the site are now covered by these new facilities.

To develop a historical perspective of the Olin site, aerial photography with scales ranging from 1:12,000 to 1:36,000, from the years 1930, 1938, 1944, 1953, 1957, 1964, 1973, and 1981, were analyzed. This analysis centered on the possibility of buried wastes, surface dumps, changes in land use, and drainage from the site.

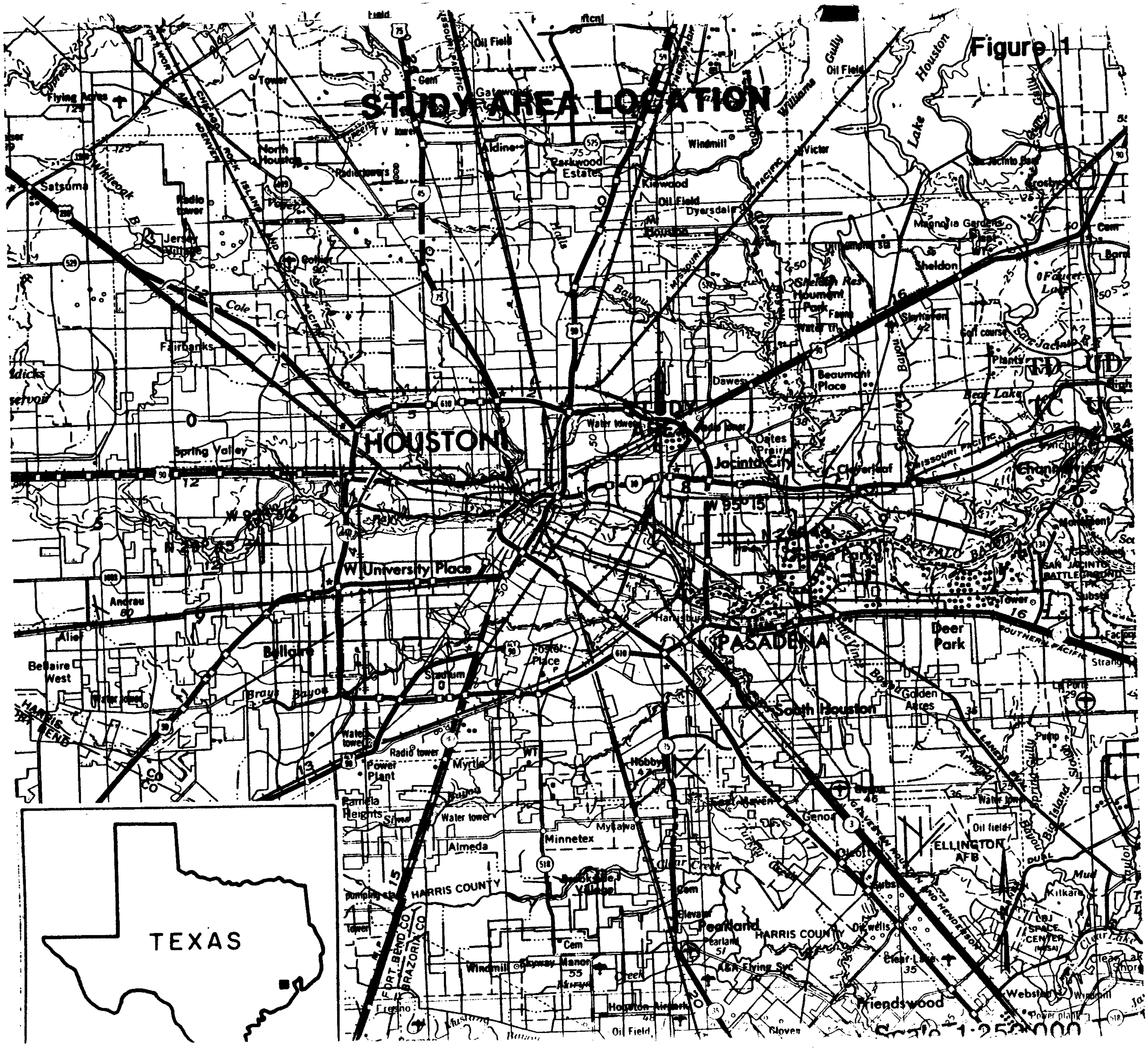


Figure 1
STUDY AREA LOCATION

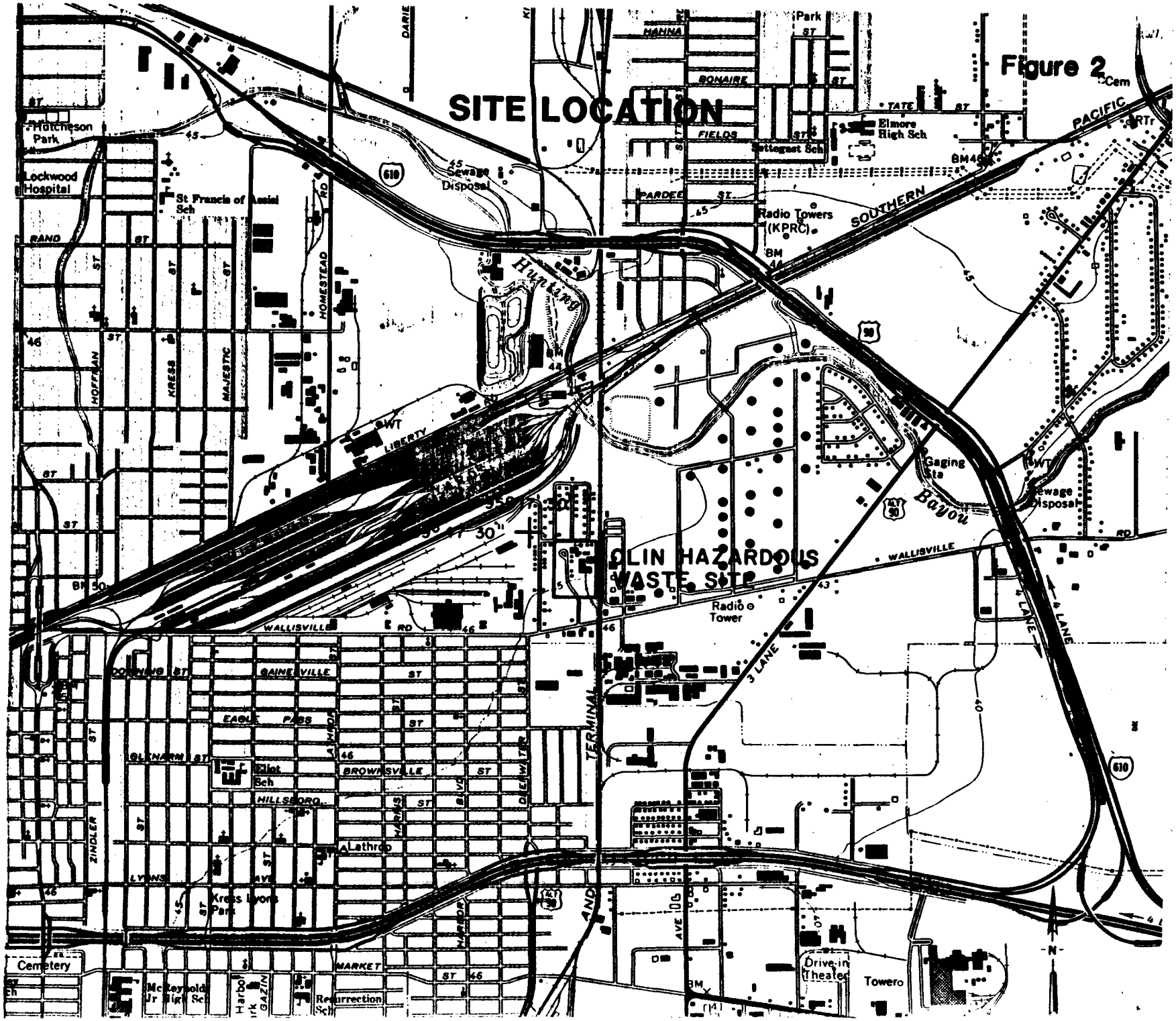


Figure 2
SITE LOCATION
OLIN HAZARDOUS WASTE SITE
Hutcheson Park
Lockwood Hospital
St Francis of Assisi Sch
Sewage Disposal
Elmore High Sch
Radio Towers (KPRC)
Gaging Sta
Bayou
Radio Tower
Flint Sch
Lathrop
Kress Lyons Park
Cemetery
Drive-in Theater
Towero
SOUTHERN PACIFIC
WALLISVILLE
GAINESVILLE
BROWNSVILLE
HILLSBORO
EAGLE PASS
LIBERTY
HOMESTEAD
TERMINAL
3 LANE
4 LANE
610
N

ANALYSIS SUMMARY

Analysis of the archival photography centered on the possibility of buried wastes, surface dumps, changes in the land use and the local drainage in and around the site. During the fifty-two year period (1930-1981) the character of the site progressed from open, undeveloped land, to the pesticide production facilities, to the current storage facilities.

The photography of 1930 (Figure 3) reveals undeveloped land where the Olin site will be located. The railroad is in place as is an oil tank farm, the Inglewood Railroad yard, a small industrial facility, and some residential development. The land is fairly flat with drainage toward the southeast.

The photography of November, 1938, reveals the first development of the site. The site is fenced, with access provided by a single road and a rail spur.

By 1944, the Olin facility appears to be in full production. The main buildings appear to be covered with a white powder. A waste pond is evident, as is a pile of unidentified materials, but there is no other indication of waste disposal.

The photography of 1953 reveals the presence of two surface dumps, the addition of new buildings, the expansion of the site boundary, and the addition of a new road and railroad spur. Both surface dumps are outside the fence line of the site. Residential development to the west of the site has blocked the natural drainage.

Another expansion of the site is evident by 1957. This expansion is into the area of the southern surface dump noted in 1953. The west surface dump has been expanded, but does not appear to be used any longer. The main building still is covered with a white powder.

A major expansion of the Olin site has occurred by 1964. The fence line has been moved to the west adding 1.2 hectares (3 acres) to the site. The west surface dump appears overgrown with vegetation and a new waste pond has been constructed in the center of the dump area. A new surface dump is visible closer to the residential area.

Another change in the site occurred between 1964 and 1973, as the west fence line has been moved once again. This time to the east, reducing the size of the site and cutting in half the surface dump noted in 1964. An unexplained barren area is now evident in the southwest corner of the site, but there is no evidence of waste burial.

The final change occurred between 1973 and 1981 as the entire Olin facility has been removed and new facilities are in place. No trace of the Olin buildings, railspurs, roads, waste ponds, surface dumps, and other facilities remain. Only a small portion of one surface dump (noted in 1964 and 1973), is outside the new development.

PHOTO ANALYSIS

1930 PHOTOGRAPHY

The 1930 photography reveals there is no industrial development on the site of the future Olin Corporation facility. There is no evidence of any activity other than a small footpath through the site. The white spot visible inside the boundary of the site is the result of a flaw in the film.

LEWOOD
ARDS
OUS
WALLSVILLE ROAD

PHOTO ANALYSIS

1938 PHOTOGRAPHY

The first development of this site is revealed by the 1938 photography. The 1.75 hectares (4.3 acres) site is enclosed by a fence measuring 137 meters (450 feet) x 128 meters (420 feet). Access is via a single two lane road and railroad spur from the Houston Belt and Terminal Railroad. The site contains a small building, approximately 15 x 7.5 meters (50 x 25 feet), a small shed and a vertical storage tank. There is no evidence of any type of dump or waste burial activity.

REFERENCE 7

Transmittal of Laboratory Reports; Old Olin Pesticide Plant, Houston, Texas, from William D. Langley, Chief, Laboratory Services Section, to William J. Librizzi, Director, Surveillance and Analysis Division, thru Malcolm F. Kallus, Chief, Houston Branch, 12 January 1981.

(7)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
6608 Hornwood Drive
Houston, Texas 77074

DATE: 12 JAN 1981

SUBJECT: Transmittal of Laboratory Reports;
Old Olin Pesticide Plant, Houston, Texas

FROM: William D. Langley, Chief
Laboratory Services Section, 6ASAHL

TO: William J. Librizzi, Director
Surveillance and Analysis Division, 6ASA

THRU: Malcolm F. Kallus, Chief
Houston Branch, 6ASAH

Transmitted herewith are the laboratory data reports for two samples submitted by FIT personnel from a site near the Old Olin Pesticide Plant, Wallisville Road, Houston, Texas, on December 4, 1980. These reports are on a new format devised to by-pass typing in an effort to facilitate more rapid transmittal of data to the Regional Office. If this report format is satisfactory or unsatisfactory, please let us know.

Please note the high level of toxaphene and pentachloronitrobenzene in the soil sample collected from the ditch adjacent to the plant.

William D. Langley

Attachments - As Stated

Houston Branch Laboratc Number 3592
Field Sample Number or ..g No. Field Sample 001
Source Olin Pesticide Plant; Wallisville Road; Houston, Texas
From ditch adjacent to plant
Date/Time Collected 12/4/80; 1315 Collected By Carruthers (FIT) Type Sample Soil

Parameter	Concentration Dry Weight Basis	Parameter	Concentration
Antimony, Sb		Silver, Ag	
Arsenic, As	1,122 mg/kg (ppm)	Thallium, Tl	
Beryllium, Be		Zinc, Zn	
Cadmium, Cd			
Chromium, Cr			
Copper, Cu			
Lead, Pb			
Mercury, Hg			
Nickel, Ni		Phenols, Total by 4AAP	
Selenium, Se		Cyanide, Total as CN	

Chlorinated Pesticides/PCB's by Gas Chromatography/Electron Capture Detector

Name	Concentration	Name	Concentration
Toxaphene	102,000 mg/kg (ppm) [= 10.2%]		
* Pentachloronitrobenzene	26,200 " [= 2.62%]		
* Methyl Parathion	14.7 " [= 0.0015%]		

These were the only

Priority Pollutants Detected by Gas Chromatography/Mass Spectrometry

Name	Concentration	Name	Concentration

Other Organics Tentatively Identified by GC/MS

Name	Est. Conc.	Name	Est. Conc.

* REMARKS: Pentachloronitrobenzene is also known as PCNB, Quintrene, and Terrachlor. It is not listed as a priority pollutant or a designated hazardous substance. Toxaphene appears on both lists. Methyl parathion is a designated hazardous substance but not a priority pollutant.

Report prepared by M. D. Langley 1/9/81

WASTE DISPOSAL SITE INVESTIGATION

SAMPLE WORK SHEET

HNB Sample No. Assigned 3592 Priority Assigned: _____
Project Name and No. Old OLIN PESTICIDE PLANT
Location WALLISVILLE ROAD, HOUSTON, TX Ditch Adjacent to OLIN
Station No. or Field No. 1-001 Tag No. X
Sampler (Name) Bill Carothers Date/Time Collected 12/4/80; 1310
Submitted By (circle) (FIT) 6ASAHF 6ASAA 6ASAE 6ASASC Other ____
Received By (for lab) Langley Date/Time 12/4/80; 1445
Was Seal intact on receipt? (circle) (Yes) No
Was there a chain of custody document? (Yes) No, Document No. None (No document number)
Type of Sample (circle) Aqueous, Non-aqueous liquid, (solid), multi-phase.
If solid, best described as (circle) (soil) sediment sludge
If multi-phase, _____ %aqueous _____ % solid _____ % non-aqueous
Condition of sample on receipt Good
Estimated quantity of sample (volume or weight) 1 qt (2000g.)
Type of container 1 qt glass jar
No. of containers in sample set if more than one _____
Description of sample (color, physical appearance, etc.) _____
contained yellow substance; had strong odor

Sample to be processed for:

Total Metals (13)	
Specific Metals	Arsenic
Base/Neutral Organics	
Acid Organics	
Volatile Organics	
Pesticide/PCB	
Pesticide only	X
PCB only	
Total Phenols	
Total Cyanide	
Other	

Remarks _____

Signature W. A. Langley Date 12/10/80

Houston Branch Laboratory Number 3593
Field Sample Number or Log No. Field Sample 002
Source Olin Pesticide Plant, Wallisville Road, Houston, Texas
Farm ditch adjacent to plant
Date/Time Collected 12/04/80, 1310 Collected By Carruthers (EPT) Type Sample Water

Parameter	Concentration	Parameter	Concentration
Antimony, Sb		Silver, Ag	
Arsenic, As	8.8 µg/l (ppb)	Thallium, Tl	
Beryllium, Be		Zinc, Zn	
Cadmium, Cd			
Chromium, Cr			
Copper, Cu			
Lead, Pb			
Mercury, Hg			
Nickel, Ni		Phenols, Total by 4AAP	
Selenium, Se		Cyanide, Total as CN	

Chlorinated Pesticides/PCB's by Gas Chromatography/Electron Capture Detector

Name	Concentration	Name	Concentration
alpha-BHC	0.47 µg/l (ppb)		
beta-BHC	0.91 "		
gamma-BHC (lindane)	0.56 "		
delta-BHC	0.58 "		

Priority Pollutants Detected by Gas Chromatography/Mass Spectrometry

Name	Concentration	Name	Concentration

Other Organics Tentatively Identified by GC/MS

Name	Est. Conc.	Name	Est. Conc.

REMARKS:

Report prepared by W. D. Langley 1/9/81

WASTE DISPOSAL SITE INVESTIGATION

SAMPLE WORK SHEET

HNB Sample No. Assigned 3593 Priority Assigned:
Project Name and No. OLIN PESTICIDE PLANT
Location Wallisville Road, Houston, Tx Ditch adjacent to Olin
Station No. or Field No. 2-002 Tag No.
Sampler (Name) Bill Cravens Date/Time Collected 12/4/80 ; 310
Submitted By (circle) (FIT) 6ASAHF 6ASAA 6ASAE 6ASASC Other
Received By (for lab) Langley Date/Time 12/4/80 ; 1445
Was Seal intact on receipt? (circle) (Yes) No
Was there a chain of custody document? (Yes) No, Document No. None — No document number L
Type of Sample (circle) (Aqueous) Non-aqueous liquid, solid, multi-phase.
If solid, best described as (circle) soil sediment sludge
If multi-phase, %aqueous % solid % non-aqueous
Condition of sample on receipt Good
Estimated quantity of sample (volume or weight) 1 quart
Type of container 1 qt. glass
No. of containers in sample set if more than one
Description of sample (color, physical appearance, etc.) Clear

Sample to be processed for:

Total Metals (13)
Specific Metals Arsenic.
Base/Neutral Organics
Acid Organics
Volatile Organics
Pesticide/PCB
Pesticide only X
PCB only
Total Phenols
Total Cyanide
Other

Remarks

Signature M. D. Langley Date 12/10/80

REFERENCE 8

Observation and Documentation of Off-Site Clean-up at the Old Olin Corporation Plant Site, Houston, Texas, from Imre Sekelyhidi, FIT, E & E Region VI, to Charles Gazda, Chief, EPA Compliance Section, thru K.H. Malone, Jr., FITL, E & E Region VI, 30 January 1981.

EPA PROJECT II

Ecology and Environment, Inc.

MEMORANDUM

TO: Charles Gazda, Chief
EPA Compliance Section

FROM: Imre Sekelyhidi, FIT
E & E Region VI

THRU: K. H. Malone, Jr., FITL
E & E Region VI

DATE: January 30, 1981

RE: TDD # F-6-8101-37

SUBJECT: Observation and Documentation of Off-Site Clean-Up at the Old Olin Corporation Plant Site, Houston, TX

In accordance with TDD, E & E FIT member contacted Mr. Daniel W. Bridge, Project Manager of Rollins Environmental Services, Inc., Deer Park, TX, to make arrangement for observation of the subject clean-up operation scheduled for January 20, 1981.

On the morning of January 20 FIT representative surveyed visually the site of clean-up operation and photographed pre-cleanup site conditions (see photographs # 1 thru 5). Due to heavy rain the day and night before, clean-up was postponed to 1:00 p.m.

During the remaining part of the morning FIT member visited the Rollins facility in Deer Park, TX, and obtained information relating to Rollins previous activities at the Old Olin Site subsequent to January 14, 1981.

On the afternoon of January 20, 1981, Rollins Environmental Services started removed the four waste piles down to the surface, as directed by Mr. Dennis Guild of EPA Region VI, Enforcement Division (see photographs # 6 and 7). In addition to FIT members, the following were present.
Daniel W. Bridge, Project Manager, Rollins, E.S., Inc., Deer Park, TX
J. E. Martin, Chief Engineer, Houston Belt & Terminal Ry Company, Houston, TX
Edward L. Hillier, Manager, Rollins E.S., Inc., Deer Park, TX
Clarence Johnson, Field Representative, TDWR, Deer Park, TX
A team of four laborers, led by Richard N. Winders, Field Operations Superintendent of Rollins E.S., Inc.

The character of the materials on the site is illustrated on photographs # 9 thru # 13. See comments at photos for interpretation of the substances present. Clean-up of the surface deposits was completed by 4:00 p.m. (see photographs #14 and 15).

In the course of surveying the site, materials having the same chlorinated odor were found on the west side of the Southern Pacific trailer lot (see photograph # 16 for location), scattered sulfur granules were on the open ground (photograph # 18), and materials found at about 6" below surface exibited similar characteristics (see photographs # 19 and 20) to those at the site.

Rollins personnel collected several samples from the waste piles and from below surface materials, and a water sample at the southwest side of the Old Olin Plant (see photograph # 22 for well). The total number of samples collected by Rollins was 14, (see attachment # 4 for Rollins' sketch and description of sample locations).

On January 21, 1981 FIT member visited the U.S. Geological Survey Subdistrict Office, 2320 La Branch, Houston, TX, to obtain the latest available information on the geology and groundwater conditions of the area in the vicinity of the site. Mr. Robert K. Gabrysch, Acting Subdistrict Chief was consulted and USGS files were reviewed.

Upon return site history was reviewed and geological and hydrologic conditions were analyzed (see "Background Analysis").

Based on available information a "Maximum Sampling Plan" was developed and modidified with EPA Region VI S & A and Enforcement Division input (see attachment # 1, "Sampling Plan").

Rollins E.S., Inc. sent four of their samples to NUS Laboratories, Clear Lake, TX, as of January 30, 1981 results of the analyses were not available (Rollins expects the results by February 3, 1981).

In summary, the clean-up operations were performed as directed and further investigation appears to be warranted.

/st
attchs.

BACKGROUND EVALUATION

Site History

(Source: Mr. Jim Brown, Environmental Coordinator, Olin)

The Old Olin Plant Site, Houston, TX, was purchased from the Southern Acid and Sulfur Company in 1938. Plant was used for a time to manufacture ammonium sulfate fertilizer, and the southwest 1/4 of the site was used as a test plot for growing various crops. On or about 1950, the plant was converted to a formulation plant for cotton pesticides, and this type operation continued until 1970. During this period, the following pesticides are known to have been formulated:

(1) Dieldrin
(2) Aldrin
(3) Benzene hexachloride (alpha, beta, gamma isomers-lindane)
(4) Heptachlor
(5) Sevin
(6) Malathion
(7) Parathion
(8) DDT
(9) Toxaphene

The plant employed, on an average, thirty people and was closed in 1970. Factors that figured in the decision to close the plant were the increasing difficulties in meeting environmental standards and the age (obsolescence) of the facility.

When the plant closed most of the people were transferred to the Olin Plant in Pasadena, TX now known as Pasadena Chemical Company. Two individuals who worked at the Old Olin Plant and may be contacted are Mr. Harold Harding (Pasadena Chemical Co.) and Mr. A. M. "Max" Watkins (Olin plant, North Little Rock, AR). Olin presently operates a facility similar to these plants at Leland, MS.

During the 1972 clean-up of the Old Olin Site, at least two truckloads of material, assumed to be contaminated, were shipped to the Pasadena Site and buried under deposits of waste material, arising from phosphoric acid manufacture. This material and its location, is included in the Eckhardt List.

(Source: Mr. Chuck Chalker - Mustang Industrial Equipment Co., Property Manager (713)460-2000, Eureka Investment Company)

The Olin Plant Site was purchased on or about 1972 and was subsequently extensively modified. Buildings were demolished, irrigation pipe removed, the railroad spur eliminated and fill added to raise the level of the entire site 6 to 8 inches.

The demolition and hauling operations were carried out by Olshan Wrecking Company of Houston, Texas. The soil was treated with lime to stabilize it to standard highway department specifications.

After treatment operations were completed, Mustang Industrial Equipment Company constructed its facility on the southwest corner of the site. Five years later, in 1977, the Southern Pacific Transportation Company purchased the eastern half of the site, and also an access corridor to Exchange St., approximately nine acres. The northwest corner of the site (3-1/2 acres) is leased to Seatrain Pacific Service, a containerized freight shipping firm.

Geology

The Old Olin Plant is located along an outcrop of the Beaumont Formation, a Pleistocene sequence of clay, silt, and sand. It consists of interfingering stream channel, point bar, natural levee and backswamp deposits and to a lesser extent coastal marsh and mud-flat deposits.

Due to this complex stratigraphy, established wells in the area (shown on attachment 2) are situated in single sand bodies at depths greater than 200 feet. These sand bodies have thicknesses varying from 14 feet to 54 feet and are often overlain by impervious shales.

Therefore, the representative nature of these wells would be highly questionable. The possibility of groundwater communication between the site and any of those isolated sand bodies is a question only localized studies can answer.

Hydrology - Surface Water.

The topography of the area was reviewed and estimates of runoff made using conventional methods.

Tributary area boundaries were established by considering the containing effects of the Englewood Railyards northwest of the site, the railroad tracks and track levee east of the site, and natural flow patterns, based upon topography, southwest of the site. Runoff coeffecients were determined by averaging coefficients selected from different sources. Runoff estimates were made of the outlined area for two receiving points by using the rational formula for estimating peak runoff rates.

With a rainfall intensity of 3 inches per hour a runoff of approximately 20 cubic feet per second (cfs) is expected to enter point "1" of the receiving ditch and an approximate flow of 60 cfs to enter point "2" (see attachment 3). These figures are likely to be high because intercepting storm sewers are used in the residential section north of the site.

Hydrology - Groundwater.

The general groundwater flow direction is to the southeast, south and southwest. Several years ago the direction was southeasterly. but due to heavy groundwater development, it is changing more to the south and southwest.

It is recommended that shallow observation wells (less than 20 feet in depth) be located and/or installed within a 1/2 mile radius of the site to determine the groundwater characteristics of this area.

ATTACHMENT #1

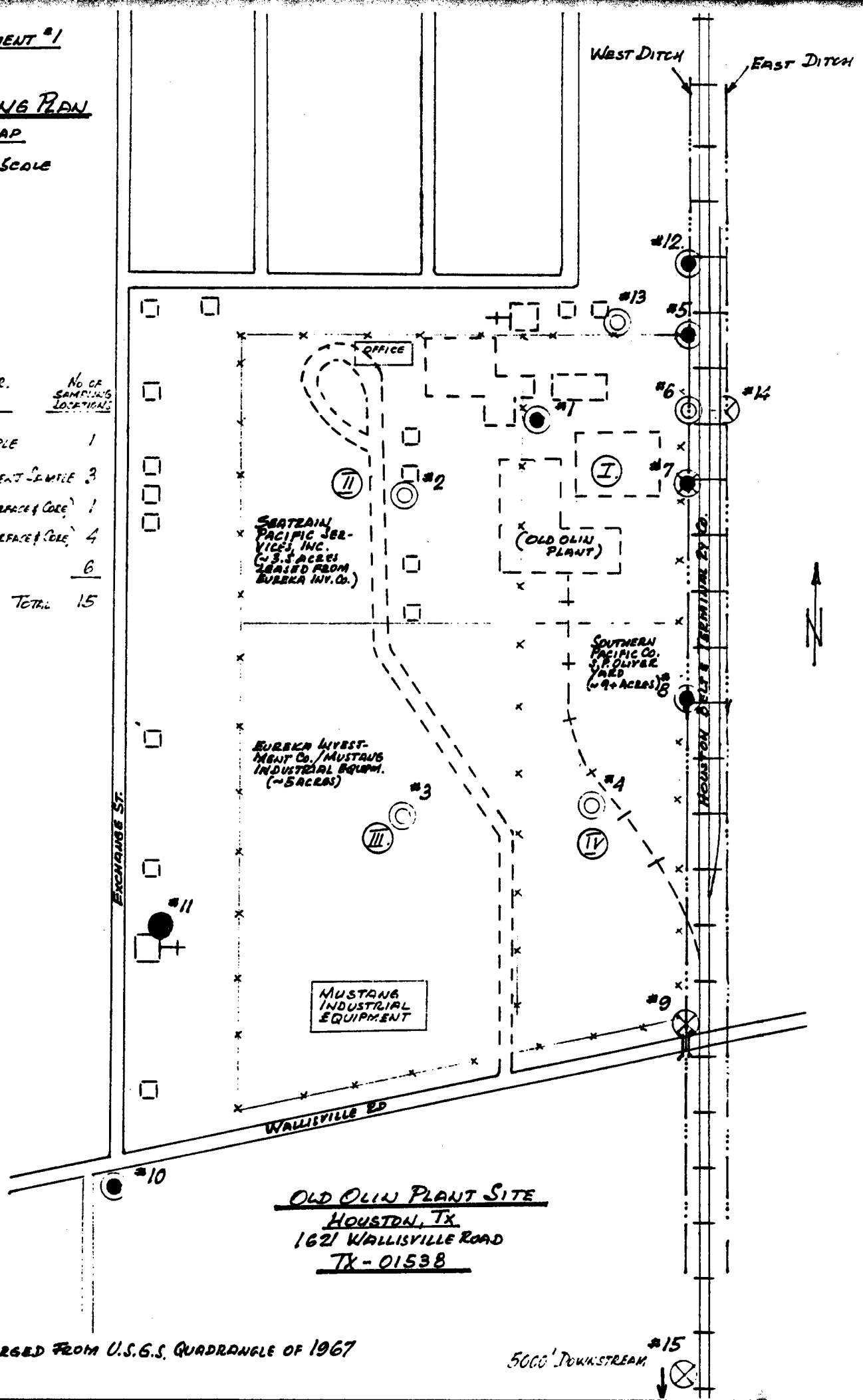
SAMPLING PLAN

SITE MAP

APPROXIMATE SCALE
1:2400

LEGEND:

SYMBOLS - DESCR.	No. OF SAMPLING LOCATIONS
WATER SAMPLE	1
WATER & SEDIMENT SAMPLE	3
WATER & SOIL (SURFACE & CORE)	1
SOIL SAMPLE (SURFACE & CORE)	4
SOIL (CORE)	6
TOTAL	15



OLD OLIN PLANT SITE
HOUSTON, TX
1621 WALLISVILLE ROAD
TX-01538

MAP ENLARGED FROM U.S.G.S. QUADRANGLE OF 1967

SAMPLING PLAN (▲ SAMPLES TO BE TAKEN)

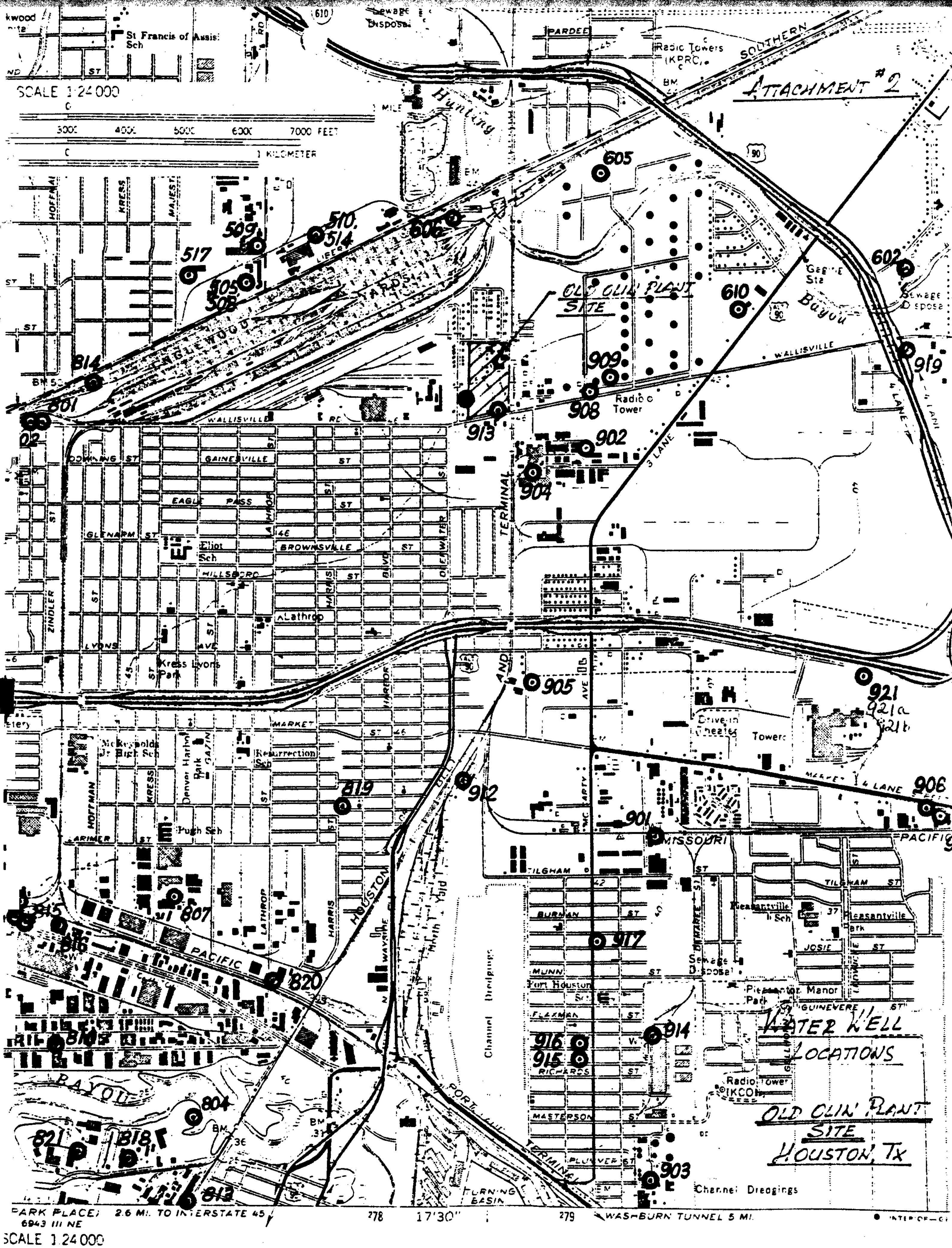
FIT, REGION VI

JAN 29, 1981

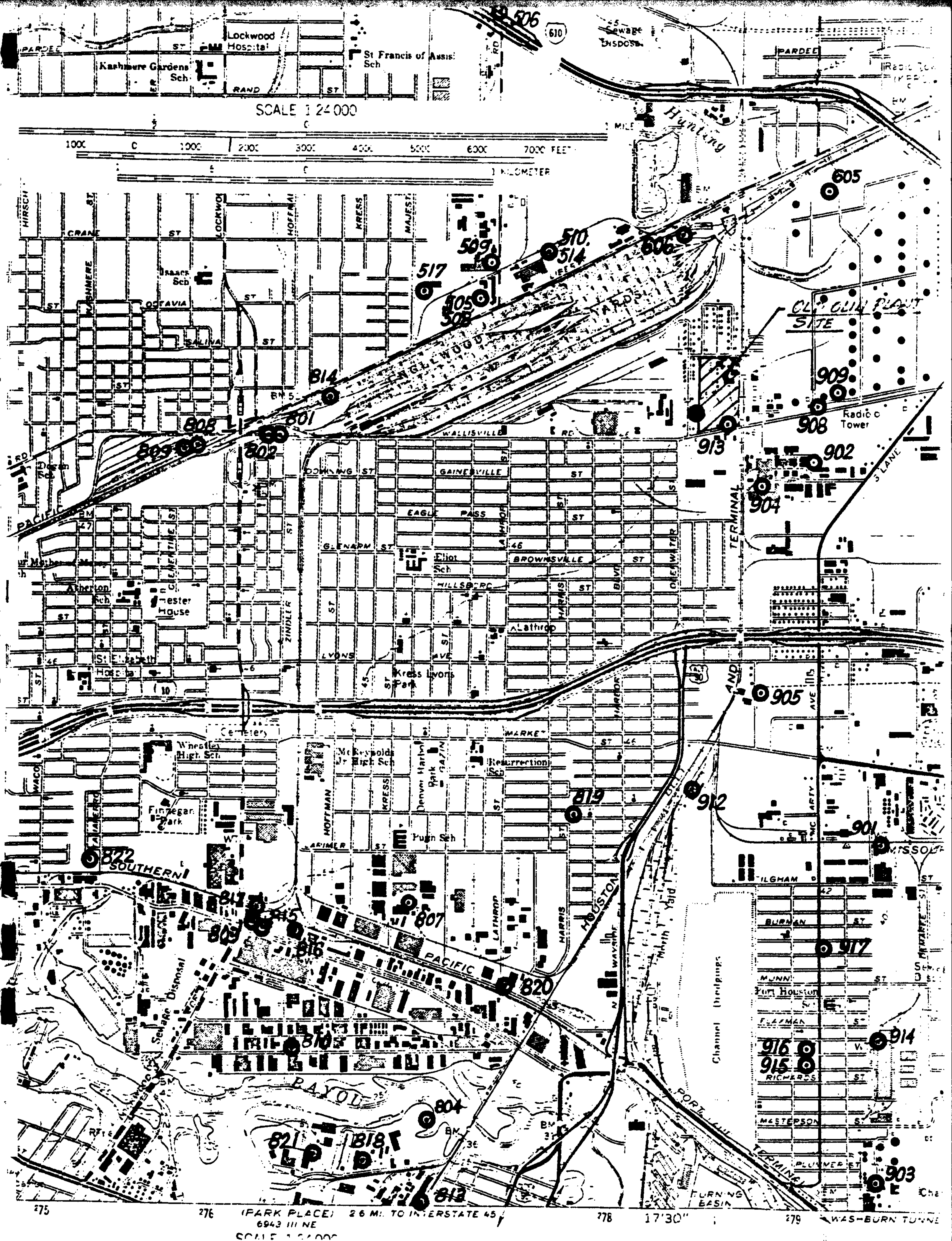
[illegible]D OLIN PLANT SITE
HOUSTON, TX

SAMPLE LOCATION			TYPE OF SAMPLE								
			WATER		SOIL						
No.	SYMBOL (ON SITE SKETH)	DESCRIPTION	SURFACE	GROUND	SURFACE	6"	12"	18"	24"	36"	? "
		NUMBER OF SAMPLES 30	3	2	5/3	3	2	2	5	1	4
		ON-SITE									
1.	◉	I. QUADRANT - ALONG W. FENCE ~ 150' S. OF N. FENCE			▲●				▲⊙		▲⊙
2.	◎	II. QUADRANT - LOCATION TO BE DETERMINED ON FIELD							▲⊙		▲⊙
3.	◎	III. QUADRANT - LOCATION TO BE DETERMINED ON FIELD							▲⊙		▲⊙
4.	◎	IV. QUADRANT - LOCATION TO BE DETERMINED ON FIELD							▲⊙		▲⊙
		OFF-SITE - [illegible] OF SITE									
5.	◉	W. DITCH - N.E. CORNER (E. OF SITE)			▲●				▲●		
6.	◎	W. DITCH - 100' S. OF N.E. (E. OF SITE) CORNER				▲○				●	
7.	⊗◉	W. DITCH - 200' S. OF N.E. (E. OF SITE) CORNER		▲⊗ (SOIL WATER)	▲○				▲●		
8.	◉	W. DITCH - 500' S. OF N.E. (E. OF SITE) CORNER			▲⊙				▲⊙		
		- SOUTH DITCH									
9.	⊗	W. DITCH - 1000' S. OF N.E. CORNER (E. OF SITE) (@ WALLISVILLE RD) W SOUTH DITCH	▲⊗		▲● (SEDIMENT)						
10.	◎	S. DITCH - S.E. CORNER OF (SW OF SITE) WALLISVILLE AND EXCHANGE ROADS				▲●	▲○				
		- GROUND WATER									
11.	●	WELL AT CHURCH, W. OF SITE		▲⊗							
		CONTROLS - UPSTREAM/ UPGRADIENT									
12.	◉	W. DITCH - 100' N. OF N.E. (E OF SITE) CORNER			▲○		▲●				
13.	◎	WASH N. OF FE[illegible] 100' W. OF N.E. CORNER				▲●					
		- E. SIDE PAST "BARRIER"									
14.	⊗	E. DITCH - 100' S. OF N.E. (E. OF SITE) CORNER	▲⊗		▲● (SEDIMENT)						
		- DOWNSTREAM/ RECEIVING WATER									
15.	⊗	W. DITCH - 5000' S. OF (E. OF SITE) N.E. CORNER	▲⊗		▲● (SEDIMENT)						

⊗ SUBMIT TO CONTRACT LAB (COMPLETE ANALYSES)
⊙ SUBMIT ONE TO EPA LAB - HOLD ONE FOR FUTURE ANALYSIS
● SUBMIT TO EPA LAB (PESTICIDES)
○ HOLD FOR FUTURE ANALYSIS

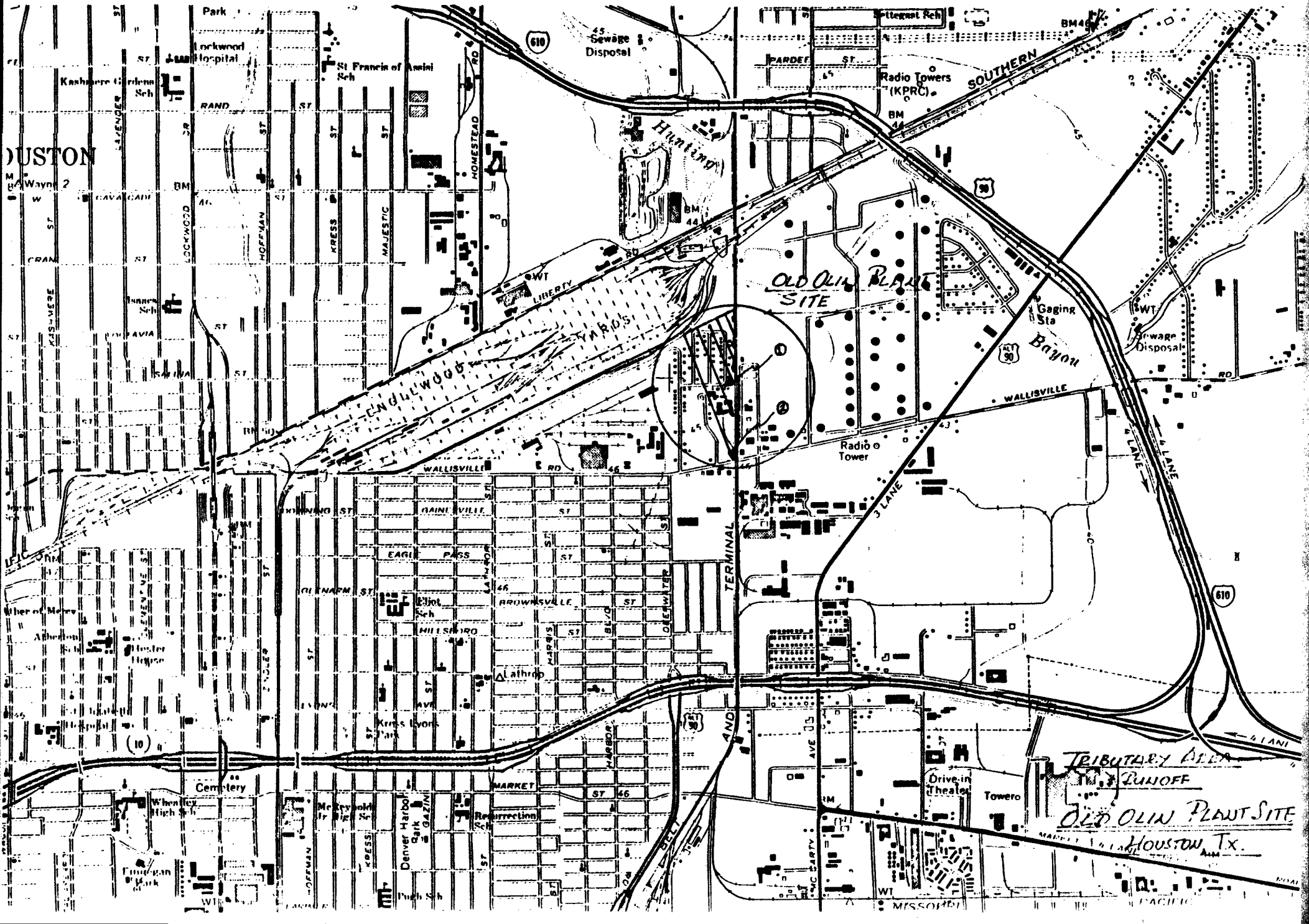


ATTACHMENT #2
SCALE 1:24 000
1 MILE
3000 4000 5000 6000 7000 FEET
1 KILOMETER
St Francis of Assisi Sch
Sewage Disposal
PARDEE
Radio Towers (KPRC)
SOUTHERN
Hunting
605
510, 514
509
517
606
505 508
ENGLEWOOD YARDS
OLD OLIN PLANT SITE
602
Gagne Sta
Sewage Disposal
Bayou
610
WALLISVILLE
919
909
908
Radio Tower
814
801
902
913
904
3 LANE
4 LANE
GAINESVILLE ST
EAGLE PASS ST
GLENARM ST
BROWNSVILLE ST
Eliot Sch
HILLSBORO
Lathrop
LYONS AVE
Kress Lyons Park
TERMINAL
905
921
921a
921b
Drive-in Theater
Towers
MARKET ST
McReynolds Jr High Sch
Resurrection Sch
Denver Harbor Park
819
912
906
901
MISSOURI
PACIFIC
Pugh Sch
TILGHAM ST
LARIMER ST
807
815
816
820
BURNHAM ST
Pleasantville Sch
Pleasantville Park
JOSIE ST
917
MUNN ST
Fort Houston Sch
Sewage Disposal
Pleasanton Manor Park
GUINEVERE ST
FLAXMAN ST
HOUSTON
Channel Dredgings
914
916
915
WATER WELL LOCATIONS
RICHARDS ST
Radio Tower (KCOH)
BAYOU
804
MASTERSON ST
PORT TERMINAL
818
821
OLD OLIN PLANT SITE HOUSTON, TX
PLUMMER ST
903
813
TURNING BASIN
Channel Dredgings
PARK PLACE 2.6 MI. TO INTERSTATE 45
6943 III NE
278
17'30"
279
WASHBURN TUNNEL 5 MI.
SCALE 1:24 000



SCALE 1:24 000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
Lockwood Hospital
St Francis of Assisi Sch
Kashmere Gardens Sch
PARDEE
RAND ST
Sewage Disposal
Hunting
610
506
605
606
510
514
509
517
505
508
ENGLEWOOD YARDS
OLD OLIN PLANT SITE
814
909
908
Radio Tower
913
902
904
801
802
808
809
WALLISVILLE RD
DOWNING ST
GAINESVILLE
EAGLE PASS
GLENARM ST
Eliot Sch
BROWNSVILLE ST
HILLSBORO
CRANE ST
OCTAVIA
SALINA ST
Isaacs Sch
KASHMERE
LOCKWOOD
HOFFMAN
KRESS
MAJESTIC
HIRSCH
PACIFIC
Atherton Sch
Chester House
CLEMENTINE ST
ZINDLER
LATHROP ST
HARRIS
HARBOR
TERMINAL
LYONS AVE
Kress Lyons Park
St Elizabeth Hospital
Cemetery
MARKET ST
905
Wheatley High Sch
McReynolds Jr High Sch
Denver Harbor Park
Resurrection Sch
Finnegan Park
819
912
901
MISSOURI
822
SOUTHERN
Pugh Sch
LARIMER ST
TILGHAM
817
815
807
803
816
PACIFIC
820
HOUSTON
North Yard
Channel Dredgings
BURNHAM ST
917
MUNN ST
Fort Houston Sch
914
916
915
RICHARDS ST
Sewage Disposal
810
BAYOU
804
821
818
813
MCSTEPSON
PORT TERMINAL
PLUMMER ST
903
TURNING BASIN
275
276
(PARK PLACE) 6943 III NE
2.6 MI. TO INTERSTATE 45
278
17'30"
279
WASHBURN TUNNEL
SCALE 1:24 000

ATTACHMENT #3



ATTACHMENT #4

DESCRIPTIONS OF SAMPLES COLLECTED AT WALLISVILLE ROAD SITE

1. Waste pile material.
2. Water at 2' depth 118' south of waste piles.
3. Sludge 2' deep near waste piles.
4. Soil at 284' south of waste piles.
5. Waste pile material.
6. "Beads" on surface 35' south of waste piles.
7. Well water from Church well along Wayside Drive.
8. Waste pile material.
9. Waste pile material.
10. Soil at 2' deep near waste piles.
11 Soil at surface 284' south of waste piles.
12. Soil at surface 108' south of waste piles.
13. Soil at surface 171' south of waste piles.
14. Soil at 2' deep 171' south of waste piles.

SAMPLES SENT FOR ANALYSIS

#1 - WASTE PILE MATERIAL

#2 - WATER AT 2' DEPTH

#3 - SOIL AT 2' DEPTH

#4 - SURFACE SOIL 284' SOUTH OF WASTE PILES

NOTE: #7 SAMPLE IS WATER FROM A WELL ABOUT 2500' WEST OF WASTE PILES.

THIS IS A ROUGH MAP. THE SCALE IS NOT EXACT, BUT APPROXIMATELY ONE INCH EQUALS 200 FEET. THE NUMBERS REPRESENT SAMPLE LOCATIONS. FOR SAMPLE DESCRIPTIONS, SEE ATTACHED LISTING.

REFERENCE 9

Record of Communication with C.W. Bonnet, USGS Houston, 2320 LaBranch, Houston, Texas 77004, prepared by Amy Layne, EPA Site Assessment Section, 10 October 1985.

RECORD OF COMMUNICATION

☑ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE
☐ OTHER (SPECIFY)
(Record of item checked above)

TO: Mr. C.W. Bonnet (713) 750-1655
USGS Houston
2320 LaBranch St; Houston, TX 77004

FROM: Amy Layne, 6H-ES

DATE 10/10/85

TIME

SUBJECT
Olin Corp., Wallisville Rd. Site (AKA: S.P. Oliver) TX01538

SUMMARY OF COMMUNICATION

Mr. Bonnet provided information regarding wells detailed on the map contained in the January 30, 1981 memorandum to Charles Gazda, Chief, EPA Compliance Section, from Imre Sekelyhidi, FIT, E & E Region VI, thru K.H. Malone, Jr., FITL, E & E Region VI, entitled Observation and Documentation of Off-Site Clean-Up at the Old Olin Corporation Plant Site, Houston, TX. Well users were contacted for additional information.

WELL NO.	DESCRIPTION
505	Drilled 1943 for General Metals Corp., Unused
508	Drilled 1938 for General Metals Corp., Unused
509	Drilled 1940 for Industrial Engineering, Unused
510	Drilled 1940 for Pittsburg Plate Glass Co., Unused
514	Drilled 1963 for Pittsburg Plate Glass Co., Unused
517	Drilled 1966 for Carbid Fabricating, Unused
602	Former Public Supply Well, Abandoned in 1968
605	Destroyed
606	Destroyed
610	Drilled 1963 for Western Line Trucking, 3523 N. McCarty, Houston, TX (713) 672-2481. Per Phyllis Ayers, the well water is currently used for drinking water (with a purifier) and for showering. Western Line Trucking currently employs 15 office employees and 30 truck drivers.
801	Drilled for Southern Pacific RR, Plugged
802	Drilled 1954 for Southern Pacific RR, Plugged
803	Drilled 1950 for Bama Food, Presumed Abandoned
804	Drilled 1962 for MacDonough Cement, Unused
807	Drilled 1963 for Industrial Towel & Uniform, Unused
808	Destroyed
809	Destroyed
810	Drilled 1971 for TX Industrial Plating, Presumed Abandoned
813	Drilled 1937 for Reed Rudder Bit, Unused
814	Drilled 1941, Destroyed

CONCLUSIONS, ACTION TAKEN OR REQUIRED

CONTINUED ON ATTACHMENT

INFORMATION COPIES
TO: FILE

RECORD OF COMMUNICATION

☐ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE
☐ OTHER (SPECIFY)

(Record of item checked above)

TO: Mr. C. W. Bonnet (CONTINUED)

FROM: Amy Layne

DATE 10/10/85

TIME

SUBJECT

SUMMARY OF COMMUNICATION

815	Drilled 1974 for Bama Food, Presumed Abandoned
816	Drilled 1938 for Standard Asbestos, Presumed Abandoned
817	Drilled 1958 for Bama Food, Presumed Abandoned
818	Drilled 1968 for Gulf Coast Cement, Presumed Abandoned*
819	Drilled 1963 for John H. Harrison, Unused
820	Drilled 1965 for Rice Hotel Laundry, P. O. Box 15160, 1441 Lathrop, Houston, TX (713) 675-6293. Per Tommy Dennis, the well water is currently used for drinking water. Rice Hotel Laundry currently employs 135 people.
821	Drilled 1965 for Houston Barge Co., Unused
822	Drilled 1965 for Comet Rice Mills, Unused
901	Destroyed
902	Drilled 1942 for Hughes Strut Plant, Destroyed
903	Plugged with Cement
904	Drilled 1943, Plugged
905	Drilled 1950 for Houston Band Mill, Presumed Abandoned
906	Drilled 1950, Unused
908	Drilled for Texas Pipeline Co., Destroyed
909	Drilled for Texas Pipeline Co., Unused
912	Drilled 1929, Unused
913	Drilled 1939 for Olin Mathieson Chemical Co., Unused
914	Drilled for Port City Compress, Destroyed
915	Destroyed
916	Destroyed
917	Destroyed
919	Drilled 1963 for Lily Lumber Co., Presumed Abandoned
921,a,b.	Drilled 1966 (Three Wells) for Houston Lighting & Power Co., Greens Bayou Power Plant, Houston, TX (713) 458-3157. Per Mr. Cullison, the three wells are currently used for drinking water. The company currently employs 134 people.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

Wells were presumed abandoned if no current listing was available for the well owner.

* Per C.L. Smith, Gulf Coast Portland Cement Co., the well water is used for industrial purposes only.

INFORMATION COPIES TO:

REFERENCE 10

Printout of Wells Within 3.0 Miles of the Olin Corp., Wallisville Road Site, provided by J.C. Holzschuh, Senior Hydrologist, Harris-Galveston Coastal Subsidence District, 1660 West Bay Area Blvd., Friendswood, Texas 77546, 10 October 1985.

3. The soil surface along the ditch contained green-yellow crystals and, in other places, reddish-brown crystals. All of these crystals emitted a chlorine odor. We found crystals in the soil surface all along the ditch to about ten feet from Wallisville Road.

4. There is bare soil on the west side of the Southern Pacific trailer lot, about 500 feet west of the railroad ditch. We dug six inches into the soil and found the soil contaminated with materials having the same chlorinated odor. Scattered sulfur granules were on the open ground.

5. We dug several more holes along the railroad ditch south of the waste piles. Water was found at 2 to 2 1/2 feet depths. At 171' south of the waste piles, a creosote odor came from material two feet deep.

On Thursday evening, January 15th Ed Hillier of R.E.S talked to Mr. Dennis Guild, Dallas, E.P.A. and explained that considerable contamination of unknown composition lay under the waste piles, probably to a 2' depth. Removal of this surface depth could expose downstream residents to unknown hazards if a severe rainstorm occurred. Mr. Guild upon consideration, directed that the surface piles of Toxaphene containing materials be the only material removed at this time. This removal would satisfy the E.P.A. ten day order and he would inform Mr. Jim Turner of E.P.A. legal of that decision.

R.E.S. was engaged by Houston Belt Line to clean up the site in accordance with the directions of Mr. Dennis Guild of Dallas E.P.A. Region VI. At 1:00 p.m. on January 20th, Rollins Environmental Services began removing the four piles of waste. The laborers wore protective suits and gas masks containing pesticide cartridges. With permission of Southern Pacific, access to the wastes was attained by using the storage lot and temporarily removing a fence section. The material was loaded into seven 55 gallon steel drums that were sealed and transported to Rollins Chemically Secure Landfill Site in Deer Park for disposal. Net weight of the waste was 3,860 pounds. The project took approximately two hours.

The following people were present during the waste removal. You might want to contact them for additional information.

Imre Szekelyhidi	-	Ecology and Environment, Incorporated (214-742-6601)
Clarence Johnson	-	TDWR (713-479-5981)
J.E. Martin	-	Houston Belt & Terminal Ry. Company (713-227-4341)
Dan Bridge	-	Rollins Environmental Services (713-479-6001)
Ed Hillier	-	Rollins Environmental Services (713-479-6001)

Imre Szekelyhidi served as the E.P.A. representative. He took many photographs of the site and removal operation. Clarence Johnson has considerable knowledge of hazardous waste sites in the Houston area and can provide further information regarding this site.

As mentioned earlier, I will forward chemical analysis results to you. If we can be of further assistance, please contact me.

Sincerely,

ROLLINS ENVIRONMENTAL SERVICES (TX) INC.

Daniel W. Bridge
Project Manager
Field Service Group

DWB:tm

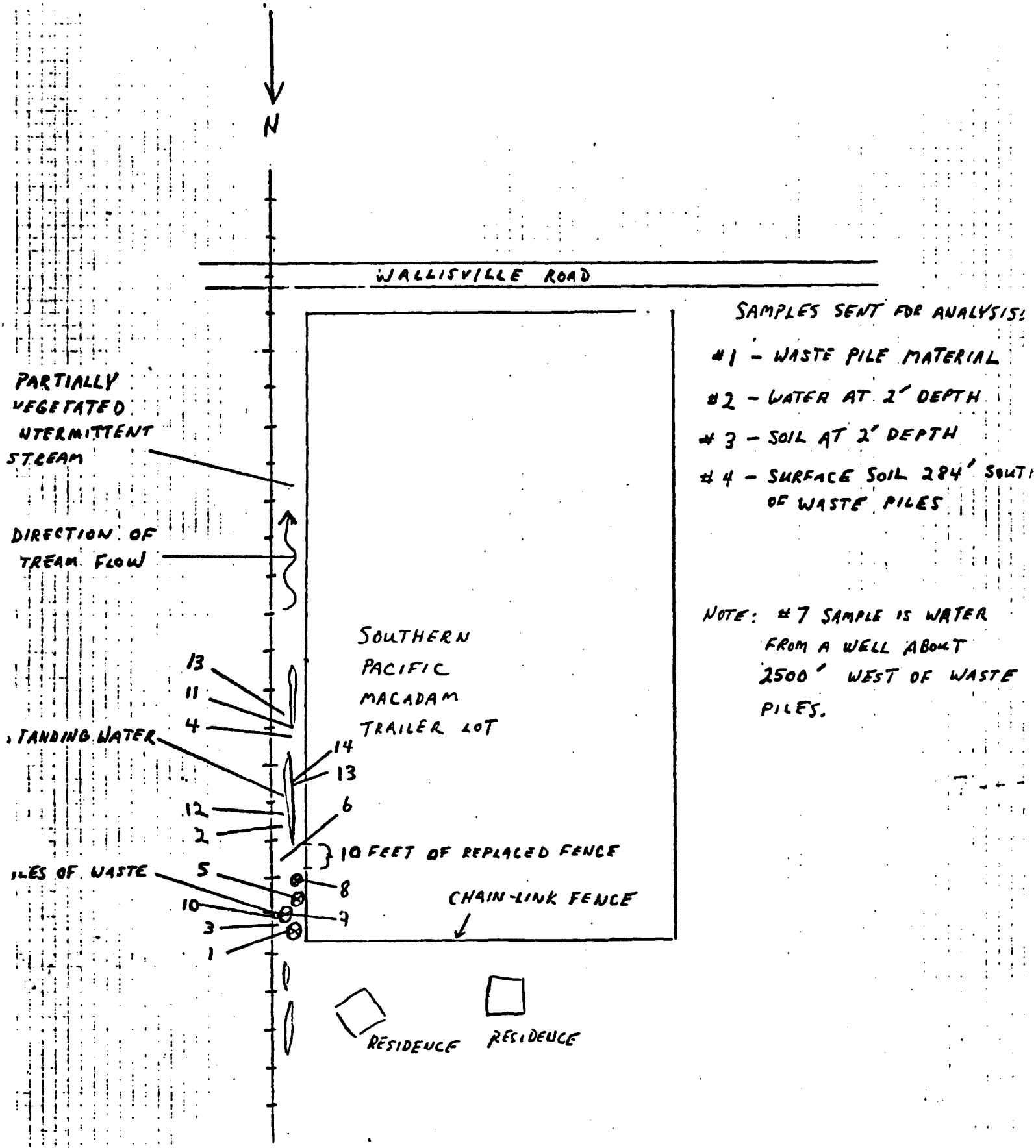
cc: Imre J. Szekelyhidi
Ecology and Environment, Incorporated
1509 Main Street, Ste. #814
Dallas, Texas 75201

Clarence Johnson
Texas Department of Water Resources
4301 Center Street
Deer Park, Texas 77536

J. E. Martin, Chief Engineer
Houston Belt and Terminal Ry. Co.
Room 206 Union Station Building
501 Crawford
Houston, Texas 77002

DESCRIPTIONS OF SAMPLES COLLECTED AT WALLISVILLE ROAD SITE

1. Waste pile material.
2. Water at 2' depth 118' south of waste piles.
3. Sludge 2' deep near waste piles.
4. Soil at 284' south of waste piles.
5. Waste pile material.
6. "Beads" on surface 35' south of waste piles.
7. Well water from Church well along Wayside Drive.
8. Waste pile material.
9. Waste pile material.
10. Soil at 2' deep near waste piles.
11 Soil at surface 284' south of waste piles.
12. Soil at surface 108' south of waste piles.
13. Soil at surface 171' south of waste piles.
14. Soil at 2' deep 171' south of waste piles.



SAMPLES SENT FOR ANALYSIS:

#1 - WASTE PILE MATERIAL

#2 - WATER AT 2' DEPTH

#3 - SOIL AT 2' DEPTH

#4 - SURFACE SOIL 284' SOUTH OF WASTE PILES

NOTE: #7 SAMPLE IS WATER FROM A WELL ABOUT 2500' WEST OF WASTE PILES.

THIS IS A ROUGH MAP. THE SCALE IS NOT EXACT, BUT APPROXIMATELY ONE INCH EQUALS 200 FEET. THE NUMBERS REPRESENT SAMPLE LOCATIONS. FOR SAMPLE DESCRIPTIONS, SEE ATTACHED LISTING.

REFERENCE 12

Letter Transmitting Sample Analyses, from Daniel W. Bridge, Project Manager, Field Services Group, Rollins Environmental Services (TX) Inc., to Imre Sekelyhidi, Ecology & Environment, Inc., 12 March 1981.

(12)

Rollins Environmental Services (TX) Inc
P. O. Box 609 Deer Park Texas 77536 (713) 479-0...

Rollins

March 12, 1981

Mr. Imre J. Szekelyhidi
Ecology and Environment, Inc.
1509 Main Street, Suite #814
Dallas, Texas 75201

Dear Mr. Szekelyhidi:

Enclosed are the analyses of the samples we procured at the Houston Belt site on Wallisville Road in Houston. We apologize for the delay.

If you have any questions concerning these samples, please contact me.

Sincerely,

ROLLINS ENVIRONMENTAL SERVICES (TX) INC.

Daniel W. Bridge

Daniel W. Bridge
Project Manager
Field Services Group

DWB:csw

Enclosure

NUS CORPORATION

ANAL ICAL SERVICES LABORATORY
SOUTH CENTRAL OPERATIONS
900 GEMINI AVENUE • HOUSTON, TEXAS 77058
713-488-1810

Rollins Environmental Services, Inc.
P.O. Box 609
Deer Park, TX 77536

Attn: Dan Bridge

Client No. Q
Date Sampled 1-20-81
Date Received 1-23-81
Date Reported 3-5-81
P.O.# 81-1500-I

No. 1 Waste Pile , Wallisville Road

NUS Sample No.			
21010405	Methoxychlor	*	
	Lindane	*	
	Toxaphene	31	g/kg
	Endrin	*	
	Dieldrin	*	
	DDT	*	
	2,4-D	<1	mg/kg
	2,4,5-TP	<1	mg/kg

Special Instructions Results are reported on basis of sample weight after drying.
*These pesticides are not detectable by standard method in the presence of the high toxaphene level found.

Test results reported in mg/liter unless otherwise noted

2

NUS CORPORATION

ANAL ICAL SERVICES LABORATORY
SOUTH CENTRAL OPERATIONS
900 GEMINI AVENUE • HOUSTON, TEXAS 77058
713-488-1810

Rollins Environmental Services, Inc.
P.O. Box 609
Deer Park, TX 77536

Attn: Dan Bridge

Client No. Q
Date Sampled 1-20-81
Date Received 1-23-81
Date Reported 3-5-81
P.O.# 81-1500-I

No. 2 Water 2' Deep, 118' S of Pile, Wallsiville Road

NUS Sample No.			
21010406	Methoxychlor	*	
	Lindane	*	
	Toxaphene	3	µg/l
	Endrin	*	
	Dieldrin	*	
	DDT	*	
	2,4-D	<100	µg/l
	2,4,5-TP	<10	µg/l
	PCB (1242)		µg/l

Special Instructions
*These pesticides are not detectable by standard GC method in presence of toxaphene and PCB.

Test results reported in mg/liter unless otherwise noted

Q2

NUS CORPORATION

ANAL[illegible]ICAL SERVICES LABORATORY
[illegible]OUTH CENTRAL OPERATIONS
900 GEMINI AVENUE • HOUSTON, TEXAS 77058
713-488-1810

Rollins Environmental Services, Inc.
P.O. Box 609
Deer Park, TX 77536

Attn: Dan Bridge

Client No. Q
Date Sampled 1-20-81
Date Received 1-23-81
Date Reported 3-5-81
P.O.# 81-1500-I

No. 3 Sludge 2' deep near Waste Piles

NUS Sample No.			
21010407	Methoxychlor	*	
	Lindane	*	
	Toxaphene	4.8	g/kg
	Endrin	*	
	Dieldrin	*	
	DDT	*	
	2,4-D	<1	mg/kg
	2,4,5-TP	<1	mg/kg

Special Instructions Results are reported on basis of sample weight after drying.
*These pesticides are not detectable by standard method in the presence of the high toxaphene level found.

Test results reported in mg/liter unless otherwise noted

2 2

NUS CORPORATION

ANALYTICAL SERVICES LABORATORY
SOUTH CENTRAL OPERATIONS
900 GEMINI AVENUE • HOUSTON, TEXAS 77058
713-488-1810

Rollins Environmental Services, Inc.
P.O. Box 609
Deer Park, TX 77536

Attn: Dan Bridge

Client No. Q
Date Sampled 1-20-81
Date Received 1-23-81
Date Reported 3-5-81
P.O.# 81-1500-I

No. 4 Soil 284' S of Piles, Wallisville Road

NUS Sample No.			
21010408	Methoxychlor	*	
	Lindane	*	
	Toxaphene	2.1	g/kg
	Endrin	*	
	Dieldrin	*	
	DDT	*	
	2,4-D	<1	mg/kg
	2,4,5-TP	<1	mg/kg

Special Instructions Results are reported on basis of sample weight after drying.
*These pesticides are not detectable by standard methods in the presence of the high toxaphene level found.

Test results reported in mg/liter unless otherwise noted

240

REFERENCE 13

Tasks Related to S.P. Oliver/Mustang/Seatrain (Old Olin) Site, Houston, TX, Composite Report, from Imre Sekelyhidi, Environmental Engineer, E & E, Region VI, to Dave Peters, Chief, Hazardous Waste Section, thru K. Malone, Jr., FITL, 10 February 1982.

(13)

Ecology and Environment, Inc.

Region VI

MEMORANDUM

TO: Dave Peters,
Chief Hazardous Wastes Section

FROM: Imre Sekelyhidi, Environmental Engineer,
E&E, Region VI

THRU: K. Malone, Jr., FITL

DATE: February 10, 1982

SUBJ: Tasks Related to S.P. Oliver/Mustang/Seatrain (Old Olin) Site,
Houston, TX, TDD #F-6-8112-22

In response to the subject TDD were performed the following interrelated tasks:

1. Review of "Draft Remedial Action Plan, Wallisville Road Site, Houston, Texas."

   The plan was reviewed first within the framework of the December 15, 1981, meeting between site and EPA presentatives, which Imre Sekelyhidi of our staff attended in accordance with TDD #F-6-8112-22, providing input in support of EPA observations concerning the plan.

   The plan was also reviewed after the meeting, in preparation for the site visit, scheduled for January 13, 1982. Third, certain specific elements of the plan were discussed with site and state representatives at this meeting.

   Attachment A briefly summarizes the result of the review.

2. Visit site with EPA and company representatives.

   On the scheduled date weather conditions prevented the EPA representative from attending the meeting. As a consequense, E&E representatives, already in the area, were requested to attend the meeting, execute specific inspections accompanied by the participants and convey EPA directives to the participants. At the outset, as well as during the inspections E&E respresentatives, Imre Sekelyhidi and Debbie Vaughn made certain that their participation was not construed by the attendees to a representation of EPA, nor would any observations and statements made during the inspection be considered EPA positions, and the events which transpired would not obligate EPA in any way.

   Attachment B briefly summarizes the results of the visit.

3. Address the need for subsurface exploration and suggest methods in addition to groundwater monitoring if possible.

   Literature on the topic was reviewed and in-house expertise was utilized to accomplish this task.

   Attachment C briefly summarizes the available subsurface exploration methods and their applicability to the Old Olin Site.

4. Address the need for additional sampling.

   The need for additional sampling was evaluated through evaluation and full consideration of the following: a. Remedial Action Plan, b. results of the December 15, 1981, and January 13, 1982, meetings, c. results of task 3, and d. review, compilation and analysis of all sampling data (the bulk of the analytical results, performed by Jacobs, and Toxicon Laboratories were received by E&E from EPA on January 25, 1982).

   Attachment D briefly summarizes the sampling need assessment.

In full consideration of the results of these tasks, a tentative sampling and subsurface exploration plan and other recommendations are presented in Attachment E.

Subsurface: The plan briefly indicates that the "character of the surface and immediate subsurface soils and the solubility of the contaminants are such that significant migration of contaminants with groundwater will not occur, "but fails to provide subsurface characterization data and information on the presence or absence of solvents, either of which may invalidate the statement.

Long Range Plan: The plan fails to offer long-range action, such as monitoring, to assure that whatever action may be taken will result in an environmentally acceptable solution.

In light of these comments, proceedings of the January 13, 1982, meeting (Appendix B) and analysis of the supplement analytical data (Appendix D). A major reconsideration of the remedial action plan is deemed necessary. Site representatives should also deal with the definition of actual subsurface condition (an overview of such action is presented in Appendix C).

H A R R I S - G A L V E S T O N C O A S T A L S U B S I D E N C E D I S T R I C T
1660 WEST BAY AREA BOULEVARD.
PHONE 713/486-1105 - FRIENDSWOOD, TX 77546

GENTLEMEN:

DUE TO THE LARGE VOLUME OF REQUESTS FOR WELL DATA, IT HAS BEEN NECESSARY TO STANDARDIZE OUR OUTPUT FORMAT.

THE ENCLOSED PRINTOUT LISTS ALL WELLS WITHIN 3.0 MILES OF THE FOLLOWING POINT BY ASCENDING LATITUDE (I.E. FROM SOUTH TO NORTH):

LATITUDE 29 DEG 47 MIN 20 SEC

LONGITUDE 95 DEG 17 MIN 20 SEC

WE REGRET WE CAN NO LONGER CUSTOMIZE OUR OUTPUT TO INDIVIDUAL SPECIFICATIONS AND HOPE THAT THE ENCLOSED WILL SERVE YOUR NEEDS.

SINCERELY YOURS,

J. C. HOLZSCHUH
SENIOR HYDROLOGIST

WELL NO.	OWNERS NAME	STATE WELL NO.	LATITUDE	LONGITUDE	ELEV.	CASING DIAM.	DEPTH TO 1ST SCREEN	TOTAL DEPTH	YEAR DRILLED	APPROX. 84 PUMP
1688	GULF COAST PORTLAND CEMENT CO. (713) 621-8580 PLANT # 926-3181	65-14-818	2945 7	951829 C.L. SMITH - FOR INDUSTRIAL USE ONLY	21	12	605	460	1962	2145007.
1711	EXXON CHEMICAL AMERICAS (713) 870-6000 (6874) Harry Hunter / RITCHIE - Exxon moved to new location 5 yrs ago. Well presumed abandoned.	65-14-9 0	294512	951645	35	10	635	701	1947	2000.
1990	RICE LAUNDRY, INC. Currently used for drinking per Tommy Simms (713) 675-6293 . 135 employees.	65-14-820	294535	9518 2	44	18	810	1085	1965	5811000.
2611	BORDEN INC. BAMA FOOD PRODUCTS	65-14-8 0	294551	951850	41	8	0	595	1958	0.
2612	BORDEN INC. BAMA FOOD PRODUCTS	65-14-8 0	294551	951850	41	8	0	667	1974	0.
1791	CINTAS CORPORATION	65-14-8 7	294553	951822	0	6	347	434	1963	0.
1718	COMET RICE MILLS, INC.	65-14-8 0	294558	951923	45	12	495	617	1965	0.
1967	SOUTHERN PACIFIC TRANS. CO.	65-14-8 0	294716	951847	50	10	999	1200	19 0	0.
1968	SOUTHERN PACIFIC TRANS. CO.	65-14-8 2	294716	951847	50	10	999	1200	1954	0.
2568	TEXAS PIPE LINE COMPANY	65-14-9 0	294720	951658	45	6	815	845	1958	0.
1675	PPG INDUSTRIES, INC.	65-14-5 0	294746	951757	46	16	850	1125	1963	0.
2918	TEXACO, INC. (713) 666-8000 668-8400 (512) 993-3510 - Tm Symonds - not currently used New: Tx Pipeline Tank Farm Contact: Dan Jones (713) 432-2767.	65-14-6 0	294747	951621	40	0	230	19 0		182500.
2595	ALLIED FENCE CORPORATION no listing	65-14-5 0	2948 4	9518 3	45	4	208	228	1960	43849.
2596	ALLIED FENCE CORPORATION	65-14-5 0	2948 4	9518 3	45	4	210	230	1963	43849.
2738	(b) (6)	65-14-5 0	294812	951738	40	4	350	702	1954	0.
2996	EXXON COMPANY, U.S.A.	65-14-6 0	294817	9517 4	45	2	0	0	19 0	0.
2247	AMERICAN IND. LIFE INS. CO.	65-14-6 0	294841	951619	46	4	260	275	1959	0.
2751	KEY OIL COMPANY (713) 923-1611	65-14-6 0	294846	9517 4	50	4	0	0	19 0	0.
2752	KEY OIL COMPANY (Channel View) (713) 923-1611 Paul Fontenot - dif employees - used for drinking water - unable to locate on map	65-14-615	294847	951513	45	4	407	422	1967	130028.
2008	MISSOURI PACIFIC RAILROAD CO. (713) 350-4100 Sam Zuckero (Settegast Yard) ~~Now: Tx Pipeline Tank Farm Contact: Dan Jones (713) 432-2767~~	65-14-6 0	294933	951726	50	16	769	887	1964	3271732.
2246	AMERICAN IND. LIFE INS. CO.	65-14-6 0	294936	951643	48	4	200	210	1955	0.

REFERENCE 11

Letter Regarding Pesticide "Spill" at 7600 Wallisville Road, Houston, to Bruce Elliot, EPA Enforcement Division, from Daniel W. Bridge, Project Manager, Field Service Group, Rollins Environmental Services (TX) Inc., 22 January 1981.

Rollins E[illegible]mental Services (TX) Inc.
P. O. Box 609, Deer Park, Texas 77536 (713) 479-6301

Rollins

January 22, 1981

Mr. Bruce Elliot
U.S. EPA Enforcement Division
1st International Building
1201 Elm Street
Dallas, Texas 75270

Dear Mr. Elliot:

This letter reviews our knowledge and activities related to the pesticide "spill" at 7600 Wallisville Road, Houston.

On January 14 we were contacted by Mr. J. E. Martin of Houston Belt and Terminal Ry. Co. The next morning Ed Hillier and I inspected the site with Mr. Martin. We found four small piles of, apparently, a chlorinated pesticide with raw sulfur included. The waste was located in a ditch between the railroad tracks and a large macadam lot used for storing trailers. A chain-link fence surrounds the lot, and a ten foot section of fence had been replaced about twenty feet from the waste piles. The fence runs approximately one thousand feet south along the railroad ditch to Wallisville Road. A rough map of the site is attached.

During rainy periods the railroad ditch serves as a drainage stream flowing south towards Wallisville Road. We observed sulfur granules in the ditch bottom to about 300 feet south of the waste piles.

In addition to sampling the waste piles, we took one-liter samples of the soil at 108', 171', 284', and additional locations down stream from the waste piles. A total of fourteen samples were obtained. The sampling locations are indicated on the attached diagram. Four of these samples are being submitted to an independent laboratory and a copy of the analysis results will be forwarded to you.

Following are observations made during our sampling periods:

1. No sulfur granules or chlorinated chemical odors could be found upstream of the waste piles.

2. We dug a hole 2 1/2' deep 10' from the largest waste pile and reached water. A hydrogen sulfide odor was released from this hole and the material was contaminated.

JAN 26 1981

nature of the Beaumont clay formation overlying the usable aquifers preclude any threat to public health or the environment through the migration of the residual contaminants from the site via groundwater movement.

The contaminants are non-volatile and with all contaminated residues covered by uncontaminated material in the form of hard surface or fill,the potential for contaminant migration via the air route is practically non-existent.

This plan calls for the removal or sealing (covering) of contaminanted soil so that it is no longer exposed to surface waters (rainfall runoff). These measures will also preclude inadvertent ingestion of contaminated soil at the site.

BACKGROUND AND SITE DESCRIPTION:

From 1950* to 1972 Olin operated a facility at 7621 Wallisville Road, Houston, at which among other operations various pesticides were formulated, packaged and shipped. When this facility was shutdown in 1972, the property consisting of about 18 acres was sold to Eureka Investment Company of El Campo (hereinafter referred to as "Eureka"). As part of the termination of Olin's operations, the Company cleaned up the plant area. Waste materials were disposed of both off-site and on site. (See Exhibit D).

Thereafter, the buildings were razed, the area graded and the property subdivided. Currently the southwest portion of the property consisting of about 5 acres is occupied by Mustang Tractor and Equipment Company (hereinafter referred to as "Mustang"). About 3.5 acres to the north of Mustang is being

---

*In 1950 Olin bought what was then a sulfur plant from Southern Acid and Sulfur Company. Olin started dry formulation of pesticides in 1950 and liquid pesticides in 1955. Exhibit B attached, lists the pesticides handled at this site by Olin. (See also Exhibit C).

leased by Mustang to Seatrain Pacific Services, Inc., (hereinafter referred to as "Seatrain"). The eastern portion of the property consisting of about 9 acres is owned by Southern Pacific which uses it as a parking lot for truck trailers. Exhibit E shows the relative location of the present occupants on the original 18 acres.

Olin submitted information relative to the on-site waste disposal in response to the Eckhardt survey and the Superfund reporting requirements. The EPA made an inspection of this site in December, 1980 as a follow-up of these submissions, and found evidence of pesticides on the Houston Belt right-of-way. Houston Belt hired Rollins Environmental Services, Inc., (hereinafter referred to as "Rollins") as a contractor who removed and disposed of several piles of contaminated material. In February, 1981, EPA conducted a more extensive sampling and analysis. EPA, Region VI, then submitted requests to Olin, Southern Pacific and Houston Belt for submission of "a comprehensive plan for clean up" of the site.

EPA SURVEYS:

Personnel from EPA, Region VI, conducted a preliminary survey in December, 1980 of the Houston Belt right-of-way. This revealed three or four small piles of material about 18 inches high and 3 to 4 feet in diameter containing toxaphene. They were located at the north end of the right-of-way just outside the east boundary of the property. EPA classified the apparent seriousness of the problem in their Site Inspection Report, dated December 19, 1980, as low.

During January, Rollins under contract to Houston Belt removed these piles of materials plus surface soil in the vicinity. The total amount of material removed was contained in seven 55 gallon drums.

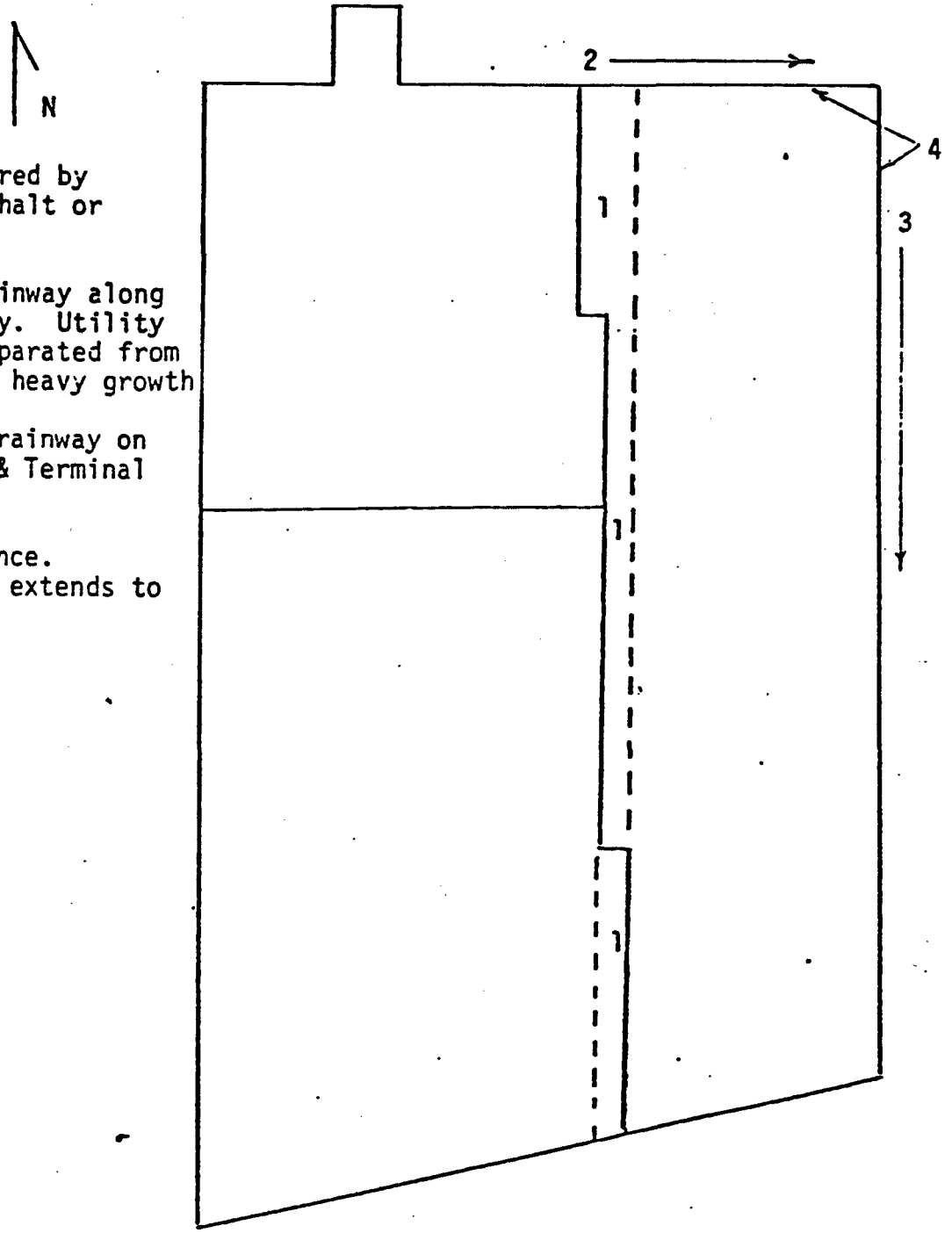
During February, 1981, EPA, Region VI, conducted a subsequent sampling and analysis. In addition to Houston Belt right-of-way, EPA also sampled on property occupied by Southern Pacific, Mustang and Seatrain and also at several adjacent off-site locations.

Three pesticides were detected in a number of these areas. These were, in decreasing order of concentrations generally found, toxaphene, DDT and PCNB. Pesticide contamination also was found in the drainways bordering the north and east boundaries of the property. Sample points together with analytical results obtained by the EPA are shown in Exhibit F.

EXHIBIT A

REMEDIAL ACTION AREAS

WALLISVILLE ROAD SITE



1. Area not covered by concrete, asphalt or shell.

2. East-West drainway along North boundary. Utility right away separated from back yards by heavy growth

3. North-South drainway on Houston Belt & Terminal right-of-way.

4. Chain link fence. Asphalt cover extends to fence.

EXHIBIT B

LIST OF PESTICIDES FORMULATED BY OLIN AT WALLISVILLE ROAD SITE

BHC

Dieldrin

Aldrin

DDT

DDD

Chlordane

Heptachlor

Toxaphene

Malathion

Parathion

methyl Parathion

Sevin

Endrin

Epichlorohydrin

Terraclor

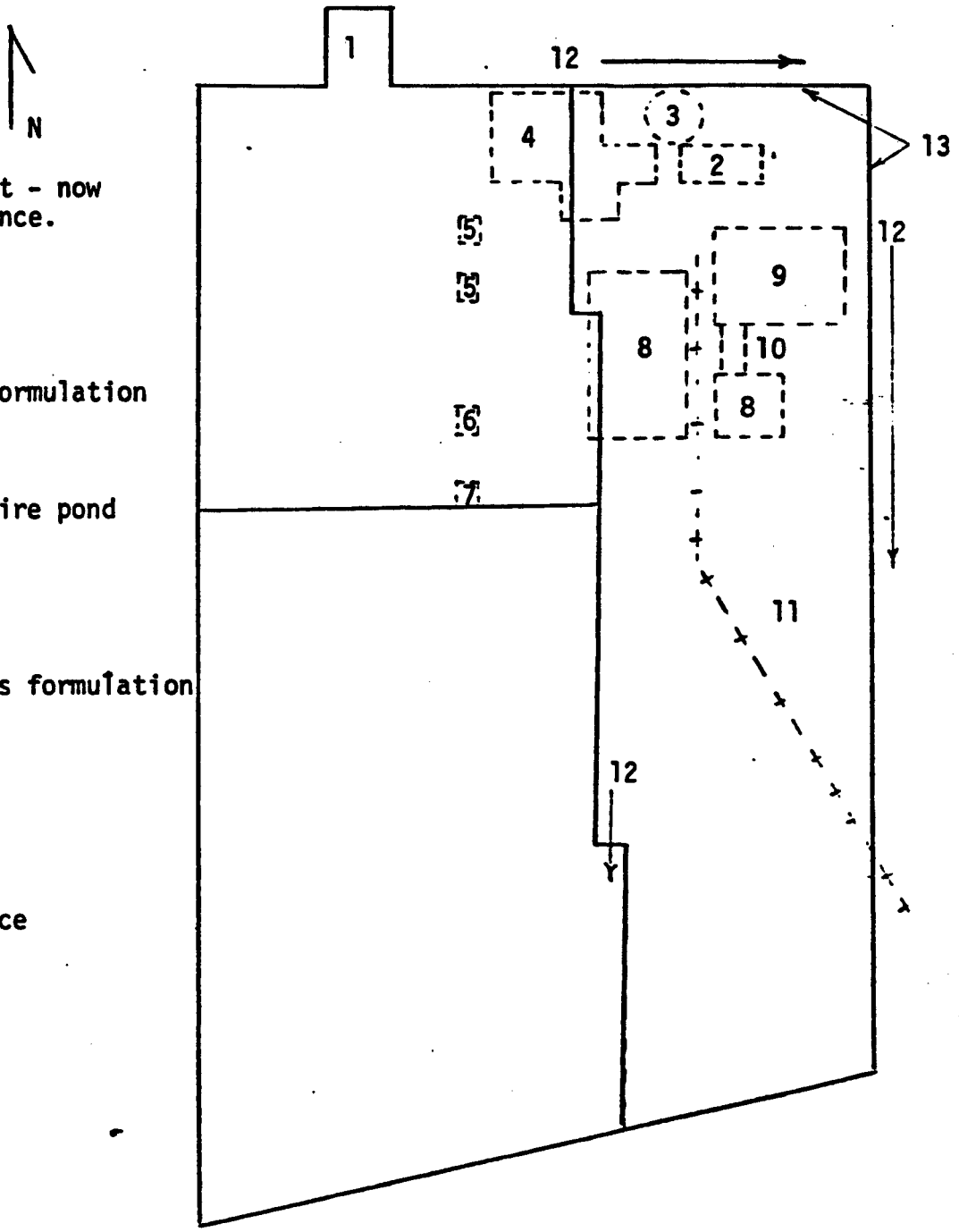
Terrazol

Methoxychlor

EXHIBIT C

OLIN OPERATIONS

WALLISVILLE ROAD SITE



1. Former Olin lot - now Seatrain entrance.
2. Sulfur storage
3. Toxaphene tank
4. Dry products formulation
5. Change houses
6. Pump house & fire pond
7. Office
8. Storage
9. Liquid products formulation
10. Ramp
11. Railroad spur
12. Drainage
13. Chain-link fence

EXHIBIT D

DISPOSAL PITS

WALLISVILLE ROAD SITE

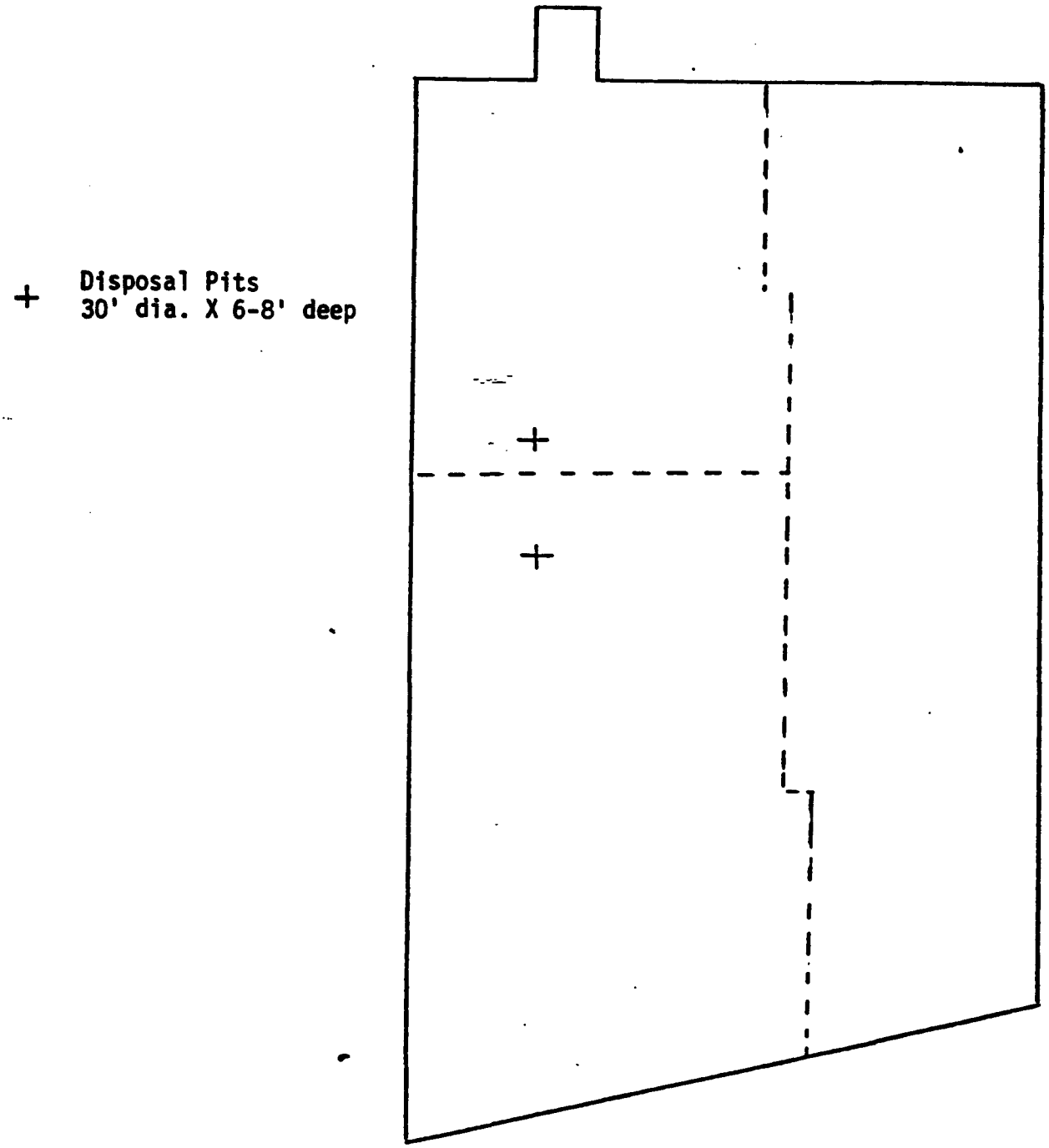


EXHIBIT E

PRESENT OCCUPANTS

WALLISVILLE ROAD SITE

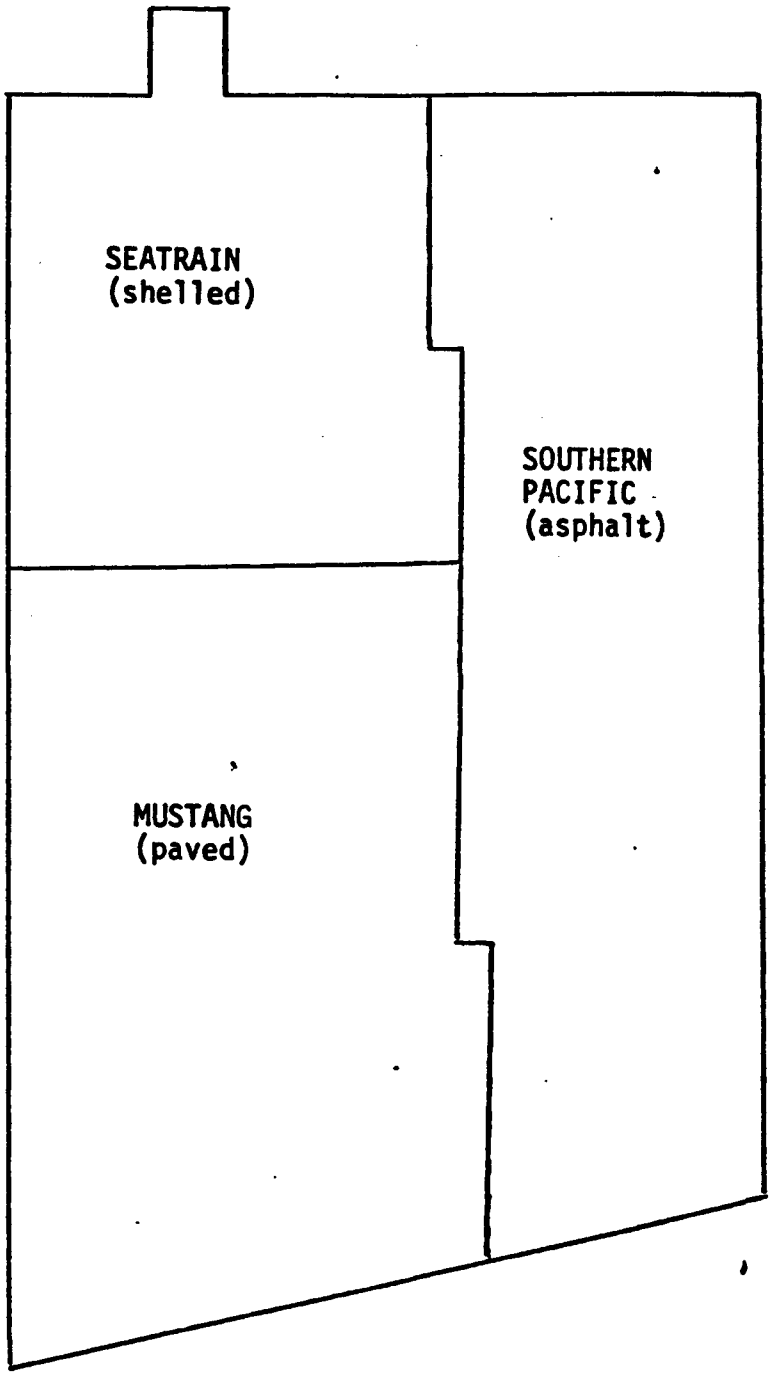
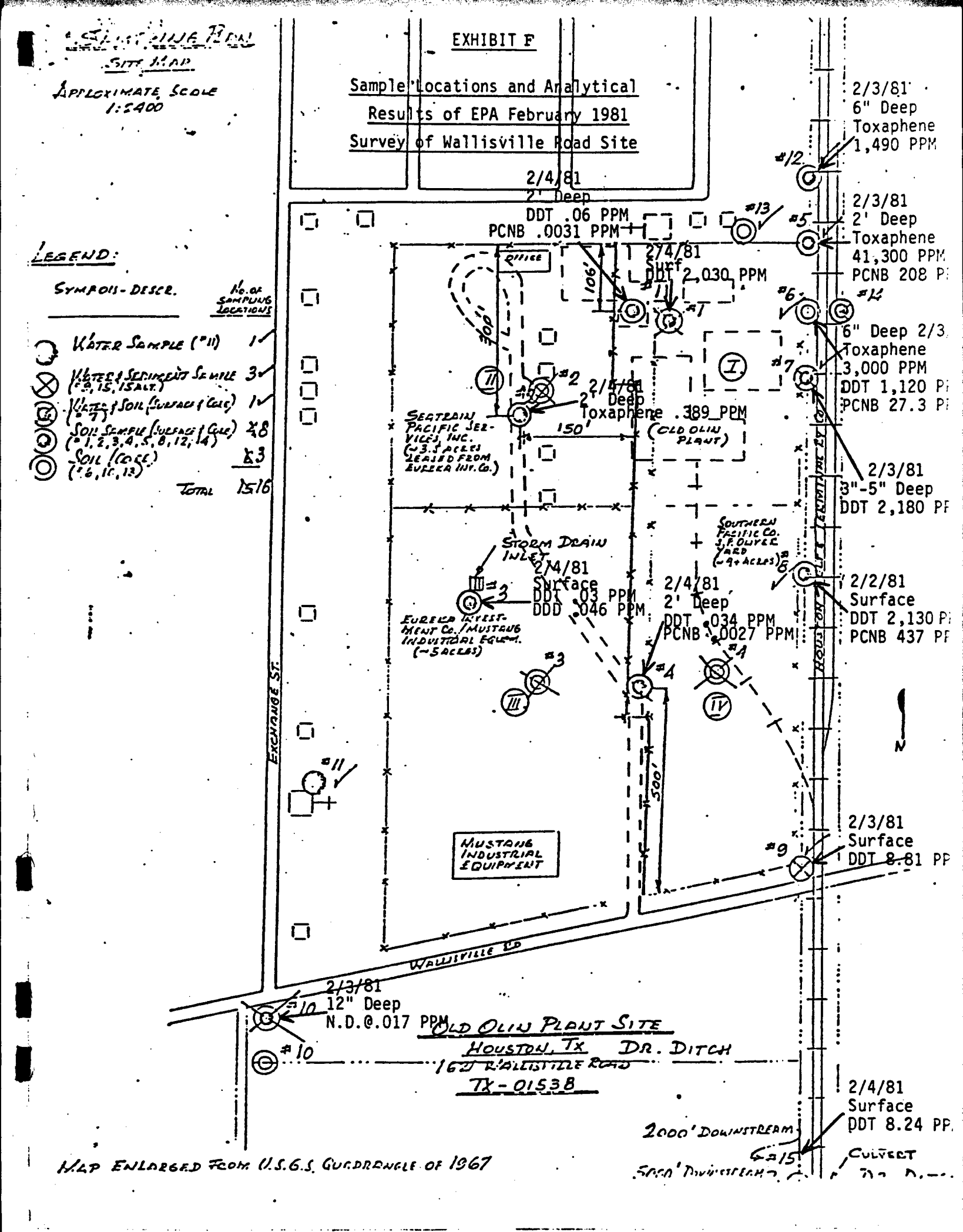


EXHIBIT F

Sample Locations and Analytical Results of EPA February 1981 Survey of Wallisville Road Site



MAP ENLARGED FROM U.S.G.S. QUADRANGLE OF 1967

ATTACHMENT A/2.

Remedial Action Plan Development - Hazardous Waste Sites

The effort required to develop a remedial action plan depends on many factors, the most important of which are:

1. The quantity and characteristics of waste deposits
2. The availability of storage/disposal/treatment methods and facilities
3. The extent and magnitude of contamination of the environment
4. The complexity of potential remedial actions, and
5. The quality and reliability of the available information

In a procedural sense the following steps are involved in developing a remedial option plan:

A. Review of history of the site
B. Review of previous studies and sampling data (i.e. waste source, surface water, groundwater, soil & sediment, etc.)
C. Development of technical background information (i.e. geography, demography, climatology, local and regional geology, hydrology, and hydraulics, etc.)
D. Development of sampling plan and execution of site sampling inspection, and data interpretation (this element of the effort is necessary if it is determined during the review phase that there was no reasonably comprehensive on-site and off-site sampling inspection performed prior to commencing the development of the remedial action plan. The extent of such inspection would involve a minimum of 8-12 samples and the number of samples could be as high a several dozen)
E. Site characterization (waste sources; method used for storing and disposing wastes; descriptions for past and present operations; extent of on-site and off-site contamination; public health and environmental concerns, etc.)
F. Estimates of quantities of wastes and contaminated materials (on-site: stored/treated/disposed; off-site: surface waters, groundwater, soils and sediments)
G. Treatment/storage/disposal of wastes (state of the art for treatment; storage methods; availability of disposal facilities; ultimate fate of pollutants of concern)
H. Remedial options - technical aspects (short term and long term options involving all waste deposits on-site and off-site contamination of the environment. For each remedial action and each distinct location development of scenario and assessment of advantages and disadvantages of the options)
I. Remedial options - relative cost comparison (relative costs of each remedial option presented under H)
J. Evaluation of remedial options (methods: storage, treatment, disposal; criteria: proven technology, risk, time, cost, legal ramifications; scheduling: priority analysis, sequencing of remedial options).
K. Monitoring system (evaluation of existing system, recommended system).
L. Conclusions and recommendations (including additional sampling requirements, engineering surveys, specialized studies, i.e. geologic study, subsurface exploration, engineering design, development needs, etc.)
M. Bibliogaphy and supporting data

ATTACHMENT B

Sites Visit and Meeting with Site and State Representatives

Background

EPA Region VI Enforcement Division arranged a site visit and meeting with representatives for January 13, 1982, at 9:30 am, Mustang Tractor and Equipment Co. office in Houston, Texas. Due to adverse weather conditions the EPA representative was unable to come to Houston. E&E was directed to proceed with the meeting and the following instruction were given to the FIT leader.

1. Check if proposed widths and lengths of proposed soil removal and replacement with compacted clay along the eastern land northern boundary of the site are adequate; what additional sampling would be needed; and how far upstream samples should be collected from the eastern site boundary ditch.

2. Check if the proped asphalt topping is adequate near the center of the site, from the north to the south end of the property; check conditions of the unpaved area in Mustang Tractor and Equipment Company's backyard.

3. Check probably area of former pit and lagoon; discuss the probability of solvents used by the former pesticide formulation facility, which may have an effect in facilitating subsurface movement of contaminants.

Imre Sekelyhidi was directed by the FIT leader to participate in the meeting only in his capacity as an E&E employee and not as a representative of the U.S. EPA.

Proceedings

At the designated time E&E representatives Imre Sekelyhidi and Deborah Vaughn met with the site and state representatives shown in Attachment B/1.

At the outset of the meeting Mr. Sekelyhidi advised the participants concerning the purpose of the visit and limitations of E&E participants. Mr. Sekelyhidid made it clear that participation of E&E representatives cannot be construed by the attendees as representation of EPA, nor should any observations and statements made by them be considered EPA positions and would not obligate EPA in any way. Mr. Sekelyhidi asked Mr. Fred W. Stumpf, attorney to conduct the meeting and site inspection.

For the benefit of those not present at the December 12, 1981, meeting Mr. Stumpf summarized the Remedial Action Plan Proposal and the important points discussed at the meeting. Mr. Stumpf also expressed disappointment over an

understanding of the fact that an EPA presentatives could not be present at the meeting. He also expressed the feeling shared by the other site representatives that EPA representatives should have an opportunity to inspect site conditions personally (himself and other site representatives indicated their willingness and desire to participate in such visit), and the appreciation of E&E representatives position. Subsequently, Mr. Stumpf turned over the meeting to Mr. Sekelyhidi.

Mr. Sekelyhidi paraphrased the directives given to him by Dennis Guild, U.S. EPA, Region VI, Dallas and advised the attendees that the well sample did not contain detectable concentrations of contaminants. Discussion ensued amplifying certain concerns. It was learned during the discussion that Mustang may have foundation data on soil borings performed prior to construction of their facility (Mr. Stumpf indicated his willingness to check into the matter and locate the information if possible). On the matter of monitoring wells, the consensus seemed to be to postpone a decision until after results of subsurface exploration. On the matter of additional information on the former disposal area, Mr. Anderson indicated Olin's willingness to a. study the time-sequential aerial photos; b. attempt to find and interview old (or former) employees regarding the chemical composition of the former disposal facilities; c. attempt to get a fix on the locations of these facilities, and d. give consideration to suitable subsurface exploration methods to define local geology.

Subsequently, participants of the meeting inspected the specific areas of concern (eastern and northern boundary ditch, center strip and Mustang's backyard). During the field inspection concensus was reached on the following points: a. necessity of upstream sampling at three equally spaced locations up to approximately 400 feet north from the northeast corner; b. necessity of addition- al sampling along the northern edge of the property; c. necessity of sampling in the central drainage ditch; d. necessity of engineering determination of drainage tributary to the boundary ditch and the central ditch; e. necessity of incorporating typical cross-sections and details regarding the proposed solution to these ditches (showing exact positions of the ditches and provisons for adquate drainage); f. necessity of expanding the proposal with inclusion of solution to the unpaved backyard of Mustang; and g. necessity to expand the proposal regarding those elements Mr. Stumpf and Mr. Anderson indicated their willingness (i.e. foundation information; and information relating to the former disposal facilities and subsurface exploration.

After the field inspection the meeting was resumed in Mustang's office. Mr. Sekelyhidid summarized the results and the meeting was adjourned with the following understandings:

1. E&E will report to EPA on the meeting.

2. Site representatives expect the next move to come from EPA in a formal response to their proposal, including what additional work EPA expects to be accomplished.

3. Site representatives preference that any additional sampling and analyses be done by EPA.

4. Site representatives desire for a formal EPA inspection.

ATTACHMENT B/1

FRED W. STUMPF
ATTORNEY AT LAW

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CLARENCE JOHNSON
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DEBORAH A. VAUGHN

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1509 MAIN ST., SUITE #814, DALLAS, TEXAS 75201,
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ATTACHMENT C

Subsurface Exploration Methods and Their Applicability to the Old Olin Site

The site is situated atop the Beaumont Formation which consists of alternating layers of clay and sand. Because the subsurface geology is highly variable, it is very difficult to determine the configuration of subsurface soils in the proximity of the site. In order to determine the local subsurface soil structure, site specific investigation is necessary.

It is believed that a multiple technological approach to subsurface investigations is required to establish an acceptable level of confidence for this site assessment. A number of technologies are available but may be of limited use because of the local subsurface soil structure. These available methods are discussed below.

Borings

As previously mentioned, the subsurface geology in the proximity of the Olin site is highly variable. Although regional groundwater flow is in a southerly direction, local flow directions may also be quite variable. Conventional methods of drilliing test holes to identify subsurface geology and potential avenues of migration, would require a great number of holes to be drilled. Costs would likely prohibit drilling a great number of test holes to define subsurface conditions and placement of monitoring wells in representative locations. To achieve an acceptable level of confidence in the evaluation of the Olin site, use of other exporation techniques should be coupled with a limited number of test holes.

Applicability of surface and subsurface remote sensing devices and techniques which may aid in determining the proper location of test holes and the structure of the soils are evaluated in the following.

Suface Resistivity Survey

This geophysical method is based on the evaluation of the apparent resistivity of a subsurface material by passing an electrical current through the ground and measuring the potential difference between two points. It appears that the use of this method is not appropriate at this site for several reasons. First, the prevalence of clays will distort the electrical current as it passes underground and would reveal little. Second, large areas of site are covered with asphalt layer which limits the usable area for the in-ground placement of resistivity probes. Third, power lines, buildings, chain link fences, and other metallic objects, which surround the sites, will also reduce the effectiveness of the equipment and will distort the results.

Electromagnetic Conductivity (EM) Survey

The low frequency EM geophysical method measures the electrical conductivities of the soil as a function of the soil/rock matrix, pore space, and fluids within the matrix. This method gives a composite conductivity over the depth monitored. This method is also of limited use due to the expected interference from local clays.

Seismic Survey

Seismic survey is based on measuring the velocity of shock or sound waves as a they reflect off of materials of differing of density and moisture content. This method can give information on the type, porosity, and water content of subsurface materials. It will also indicate depths of materials if their sound velocities are sufficiently different. The method is not affected by surface metal objects such as fences and can penetrate the surface layer of asphalt that covers the site. However, this method may be sensitive to nearby noise interference caused by automobiles, trains, and aircraft. Care must be taken to eliminate outside interferences when conducting the survey.

A seismic survey may provide data on abandoned impoundments on-site and locations of potential water bearing sand lenses beneath the site. Even more detailed data could be obtained from sounding devices place in boreholes.

Ground Penetrating Radar (GPR) Survey

GPR uses much higher frequencies than does the EM method. The frequencies are transmitted from a radar antenna coupled to the ground. The signals are reflected from various interfaces that contrast in their complex dielectric properties. The unit is skid mounted and is towed across the site for exploratory work. The GPR, however, is subject to limitations similar to that for EM methods. Certain soils, clays in particular, are highly attenuative of the signals transmitted by the radar. Signals can become "cramped" which will radically decrease the depth of penetration and resolution of the penetrated material.

Conclusions

It appears that a seismic survey coupled with data obtained from test holes would best describe the subsurface structure of soils at this site for exploration of shallow depths. Moderately priced portable seismographs may be used. A number of firms conduct seismic surveys in the Houston area and are generally available on short notice.

depths. However, it was deemed possible to develop isograms of reasonable accuracy for three pollutants (toxaphene, DDT, and PCNB) found at surface to 6" depth. These isograms are presented on Attachment D/9). In analyzing the isograms as well as all other pertinent information it is believed that:

1. The Houston Belt & Terminal Ry. Co. (Southern Pacific) tracks and substructure located at the eastern boundary of the site present an effective barrier to surface and shallow subsurface migration of pollutants.

2. The general direction of pollutant migration from the site is southerly.

3. Highest concentrations of specific pollutants occur at different locations (highest concentration of toxaphene is found at sampling location #6; DDT at #7, and PCNB at #8). This fact may be explained with the hypothesis that the locational orgin of the various pollutants is different (i.e. former disposal areas of primary chemical character may have been different).

4. There is inadequate information to place sufficient confidence in the northern and western laterial and vertical extent of pollutant presence.

In summary, all available information points to the need of further sampling and subsurface exploration. A set of recommendations is contained in Attachment E.

ATTACHMENT D

Additional Sampling Need Assessments

An additional sampling need was assessed through evaluation and full consideration of the follow:

a. Remedial Action Plan. The Remedial Action Plan was apparently based on partial analytical results (Attachment D/1) review of the plan indicates data gaps in specific areas:

1. Upstream in the eastern boundary ditch.
2. Along the northern boundary of the site.
3. Along the central unpaved area and drainage ditch.
4. The unpaved Mustang backyard area.
5. At and around the exact locations of the formal disposal area.

b. Results of the December 15, 1981, and January 13, 1982 Meetings. In addition to the above, data gaps exist regarding potential groundwater contamination (by the January 13, 1982 meeting analytical results of the church well sample became available, showing "not detectable" concentrations of pollution of concern). At the December 15, 1981 meeting, advisability of establishing a system of monitoring wells came up. It is recognized that the pollutants of main concern are practically insoluble in water (Attachment D/2). Nevertheless, due to possible presence of solvents in the former disposal areas the need for monitoring wells cannot be dismissed at this time. However, prior to attempting to locate monitoring wells it is necessary, as a minimum to: 1. define local geology, and 2. establish the presence or absence of solvents in the former disposal areas (these needs are further discussed in Attachments B and C). The need for additional sampling as it relates to additional locations inspected during the January 13, 1982, meeting is addressed in Attachment B.

c. Results of Task 3. It was concluded that the apparent most promising method of subsurface exploration is seismic survey coupled with a limited number of test holes. It appears desirable to also utilize these these test holes for sampling at key locations.

d. Review, Compilation and Analysis of All Sampling Data. The bulk of the analytical results were received by E&E on January 25, 1982. All analytical data were segregated according to depth, tabulated (Attachment D/3) and plotted on-site maps (Attachment D/4) after positive identification of the locations (shown on Attachments D/3; D/5; D/6; D/7; and D/8). In analyzing the data, it was determined that there is insufficient data to develop isograms for all

EAP II PROJECT

REGION VI

MEMORANDUM

REVIEWED BY: _____

TO: Charles Gazda, Chief
Compliance Section, EPA Region VI

FROM: Imre Sekelyhidi, FIT
E&E Region VI

THRU: K. H. Malone, Jr., FITL
E&E Region VI

DATE: March 2, 1981

SUBJECT: Sampling Inspection at the S. P. Oliver Yard, Mustang Tractor and Equipment Co. Yard, Seatrain Corp. Yard, and Houston Belt & Terminal Ry Co. Right-of-Way. (Old Olin Corp. Site), TDD # F-6-8101-48

1. PURPOSE: The purpose of this memorandum is to describe the sampling operation conducted during February 3-4, 1981 at the subject site (Old Olin Corp. Site), Houston, Texas.

2. DISCUSSION:

a. General: During the period February 3-4, 1981, the sampling inspection was conducted by five members of the Ecology and Environment Region VI Field Investigation Team (I. Sekelyhidi, B. Carrothers, G. Duncan, D. Vaughn, G. McDonald). In accordance with TDD, E & E FIT member notified the site representatives and provided the specific times the sampling inspection would take place at their respective properties. State and local authorities were also notified. Thirty-one soil and sediment samples and five water samples were collected in accordance with the attached sampling plan. The following modifications were made to the original plan.

(1) At locations #2, #3 and #4 surface soil samples were added (the original plan considered these locations to be paved, hence, no surface sampling was contemplated).

(2) At location #7, a soil sample was added for the 3-5 inch depth because of the deposits encountered at that depth.

(3) Location #10 was moved approximately 200 feet south from the SE corner of the Wallisville Road-Exchange Street intersection to the drainage ditch paralleling Wallisville Road.

(4) At location #14 there was no water. Soil samples were therefore taken at 12" and 6" depths.

(5) Location #15 was moved approximately 3000 feet upstream due to the actual drainage conditions found during the inspection (although samples were taken at the originally planned location and delivered to EPA's Houston Laboratory facility, they were not to be analyzed unless directed by EPA).

b. Description of the sample locations is attached.

c. Groundwater Geology:

(1) The site is located in the Beaumont Formation of Middle Pleistocene Age. It is characterized by clay, silt and sand sediments derived from stream channels, point bar, natural levee and backswamp deposits. Concretions of calcium carbonate, iron oxides and iron-manganese oxides are common; at this site only concretions of iron oxides were noted in several of the soil cores taken greater than 18 inches in depth. Thickness is 100+ feet with thining to the northwest and thickening to the south.

(2) Water samples were taken from surface runoff or formation water, except the sample taken from the church well (60ft.), which was within the Beaumont Formation. Not knowing the stratigraphy of the well, however, there is always the possibility that the casing is within the Montgomery Formation.

d. During the inspection, the following individuals observed the operation and/or visited the site:

Clarence Johnson, Field Representative, TDWR, Deer Park, TX
E. M. Quevedo, Chief, Public Health Engineering, City of Houston Health Dept.
Terry G. Fisher, Sampling Project Leader, City of Houston Health Dept.
Henry Brown, City of Houston Health Dept.
J. E. Martin, Chief Engineer, Houston Belt & Terminal Ry Co., Houston, Tx
Albert L. Chalker, Project Manager, Mustang Industrial Equipment Co., Houston, TX
Frank Mattera, Equipment Manager, Seatrain Co., Salina Yard, Houston,TX
James A. Glona, Clerk, Southern Pacific RR, Houston, TX
Daniel W. Bridge, Project Manager, Rollins E. S., Inc., Deer Park, TX.

3. METHODOLOGY:

a. Team Personnel: Samples were collected by two man teams. One member stayed for processing samples and cleaning equipment.

b. Personnel Safety Considerations: Samplers wore coveralls, rainsuit, rubber boots and disposable surgical gloves during the sampling operation. Ultra-twin full face air purifying respirator w/GPM-pesticide cartridge was worn while collecting samples.

c. Sampling Equipment: Water and sediment samples were collected with pond sampler equipped with glass beaker using 1/2 gallon amber glass bottles and 40 ml vials for water, and 8 oz. glass jars for sediment. Soil surface and core samples were obtained using the following equipment:

(1) Pick - used to loosen compact clay and gravel (top fill).
(2) Post Hole Digger - used to remove top fill.
(3) Hand Auger - used to depth of 2' - 3' to remove clays.
(4) Split Spoon Sampler - used to depth of 4' to remove clay beyond the auger's capabilities.

The soil samples were collected in 8 oz glass jars.

d. Sampling procedures: At each of the soil sampling locations trowel was used to obtain surface sample; the post hole digger and one of the hand augers were used to reach the desired sampling depth. Upon reaching the depth, another clean (decontaminated) auger was used to obtain the sample when soil conditions permitted. When the soil was too dense to penetrate with the hand auger, the split spoon sampler was used. The general procedure at the sampling locations was as follows:

(1) Wipe sampling equipment with acetone using paper towels.
(2) Rinse with distilled water.
(3) Penetrate top fill (pick)
(4) Remove top fill (post hold digger).
(5) Collect surface sample (trowel)
(6) Penetrate 12" (post hole digger).
(7) Penetrate to 24" (hand auger).
(8) Collect sample (hand auger).
(9) Penetrate to 48" (split spoon sampler)
(10) Remove split spoon.
(11) Remove sample and containerize.
(12) Refill hole.
(13) Decon equipment.

e. Problems encountered during sampling:

(1) Decontamination:

Problem - The hand auger, post hole digger and the split spoon sampler do not lend themselves to easy decontamination in the field. Only 30 gallons of water is carried in the van so an external source had to be located and permission obtained for its use. Furthermore, the materials adhering to the surface of digging equipment was very stubborn to remove.
Solution - External water source was located, permission obtained and running water was used for washing the equipment. Contaminated water was discharged into the railroad ditch. External surfaces of equipment was fairly easy to clean, however, an assortment of brushes and rags had to be used to loosen and remove internal contamination.

Problem - Auguer and split spoon sampler showed accumulation of surface rust between decon and the taking of the next sample.
Solution - Used acetone and distilled water prior to taking subsequent samples.

(2) Soil Penetration:

Problem - Using a pick on suspected contaminated soil splashes contaminants on clothing.
Solution - Wore wet suit (rain suit) and neoprene boots.

Problem - Post hole digger is constructed so as to limit the depth one can dig without widening the hole.
Solution - Used with hand auger for greater depth.

Problem - In dense soil the hand auger required a great deal of downward pressure while making clockwise turns. This causes the handle to break.
Solution - Used split spoon sampler.

Problem - The split spoon sampler when driven with a 10 pound sledgehammer to the final depth of 4' became lodged.
Solution - The sides were struck with sledgehammer, while two individuals exerted a constant upward pressure on the cross bar inserted for that purpose.

Problem - Removing cores from split spoon samples when the tube would not unscrew.
Solution - Used sledgehammer to loosen the treads.

TO: Charles Gazda, Chief
FROM: Imre Sekelyhidi, FIT
THUR: K. H. Malone, FITL
DATE: March 2, 1981

Attachments:
Sample Plan
Description of Sample Locations
Photograph and Negatives
Shipping Documents
Chain of Custody Records

/st

EXECUTED

SAMPLING PLAN

FIT, REGION VI

JAN 29, 1981

△ SAMPLES TAKEN

○ HELD FOR FUTURE ANALYSIS

C.D OLIN PLANT SITE

HOUSTON, TX

SAMPLE LOCATION			TYPE OF SAMPLE								
			WATER		SOIL						
No.	SYMBOL	DESCRIPTION	SURFACE	GROUND	SURFACE	6"	12"	18"	24"	36"	48"
		ON-SITE									
1.		I. QUADRANT - ALONG W. FENCE ~~150'~~ 106' S. OF N. FENCE			△				△		△○
2.		II. QUADRANT - ~~LOCATION TO BE DETERMINED ON FIELD~~ 300' S. OF N. FENCE, 150' W. OF E. FENCE			△○				△		△○
3.		III. QUADRANT - ~~LOCATION TO BE DETERMINED ON FIELD~~ NEAR STORM DRAIN INLET			△				△○		△○
4.		IV. QUADRANT - ~~LOCATION TO BE DETERMINED ON FIELD~~ 500' N. OF SOUTH FENCE			△○				△		△○
		OFF-SITE - DITCHES E. OF SITE									
5.		W. DITCH (E. OF SITE) - N.E. CORNER			△○				△		
6.		W. DITCH (E. OF SITE) - 100' S. OF N.E. CORNER				△			△○		
7.		W. DITCH (E. OF SITE) - 200' S. OF N.E. CORNER		△ (SOIL/WATER)	△○	△ (3-5")			△○		
8.		W. DITCH (E. OF SITE) - 500' S. OF N.E. CORNER			△				△○		
		- SOUTH DITCH									
9.		W. DITCH (E. OF SITE) - 1000' S. OF N.E. CORNER (@ WALLISVILLE RD) SOUTH DITCH	△		△ (SEDIMENT)						
10.		S. DITCH (SW OF SITE) - S.E. CORNER OF WALLISVILLE AND EXCHANGE ROADS				△○	△				
		- GROUND WATER									
11.		WELL AT CHURCH, W. OF SITE		△							
		CONTROLS - UPSTREAM/UPGRADIENT									
12.		W. DITCH (E OF SITE) - 100' N. OF N.E. CORNER			△○		△○				
13.		WASH N. OF FENCE, 100' W. OF N.E. CORNER				△					
		- E. SIDE, PAST "BARRIER"									
14.		E. DITCH (E. OF SITE) - 100' S. OF N.E. CORNER			△○	△○					
		- DOWNSTREAM/RECEIVING WATER									
15 ALT.		W. DITCH (E. OF SITE) - 5000' S. OF N.E. CORNER	△○		△○						
15		W. DITCH (E. OF SITE) - 2000' S. OF N.E. CORNER	△		△						

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1201 ELM STREET
DALLAS, TEXAS 75270

2/4/81
(Date)

RECEIPT FOR SAMPLES

NAME AND TITLE OF EPA REPRESENTATIVE: IMRE SEKELYHIDI, TEAM LEADER
Ecology & Environment, Inc., Dallas

(Signature)

SAMPLES COLLECTED:

SAMPLE NUMBER	TIME	PLACE COLLECTED	TYPE	VOLUME	SPLIT SAMPLE REQUESTED	SPLIT SAMPLE PROVIDED
1/1 (Surface)	1200 (hrs)	1065' S. of U. Fence along W. Fence of S.P. Yard	Soil	8 oz	No	
1/2 (24")	12:10	"	Soil	8 oz	"	
1/3 (48")	12:15	"	Soil	8 oz	"	
4 1/1 (Surface)	12:30	500' N. of S. Fence along W. Fence of SP. Yard	Soil	8 oz	"	
4 1/2 (24")	12:45	"	Soil	8 oz	"	
4 1/3 (48")	1:05	"	Soil	8 oz	"	

ACKNOWLEDGEMENT OF FACILITY REPRESENTATIVE

The undersigned acknowledges that the samples described above have been collected.

NAME, TITLE AND ADDRESS OF FACILITY REPRESENTATIVE:

James A. Glass Clerk Southern Pacific RR
7609 Willisville Rd

James A. Glass
(Signature)

2-4-81
(Date)

DISTRIBUTION: One copy facility representative
One copy for inspector's records
Original to Regional Office

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1201 ELM STREET
DALLAS, TEXAS 75270

2/4/81
(Date)

RECEIPT FOR SAMPLES

NAME AND TITLE OF EPA REPRESENTATIVE: IMRE SEKELYHIDI, TEAM LEADER
ECOLOGY & ENVIRONMENT, INC., DALLAS

(Signature)

SAMPLES COLLECTED:

SAMPLE NUMBER	TIME	PLACE COLLECTED	TYPE	VOLUME	SPLIT SAMPLE REQUESTED	SPLIT SAMPLE PROVIDED
2/1 (Surface)	11:15	300' S. of N. Fence 150' W. of E. Fence	Soil	8 oz	No	
2/2 (24")	11:30	"	"	8 oz	No	
2/3 (48")	11:45	"	"	8 oz	No	

ACKNOWLEDGEMENT OF FACILITY REPRESENTATIVE

The undersigned acknowledges that the samples described above have been collected.

NAME, TITLE AND ADDRESS OF FACILITY REPRESENTATIVE:

FRANK MATTERA Equip Mgr 7720 SALINA YD

F. Mattera
(Signature)

2/4/81
(Date)

DISTRIBUTION: One copy facility representative
One copy for inspector's records
Original to Regional Office

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1201 ELM STREET
DALLAS, TEXAS 75270

2/4/81
(Date)

RECEIPT FOR SAMPLES

NAME AND TITLE OF EPA REPRESENTATIVE: IMRE SEKELYHIDI TEAM LEADER
ECOLOGY & ENVIRONMENT, INC. DALLAS

(Signature)

SAMPLES COLLECTED:

SAMPLE NUMBER	TIME	PLACE COLLECTED	TYPE	VOLUME	SPLIT SAMPLE REQUESTED	SPLIT SAMPLE PROVIDED
3/1 (Surface)	10:30 am	Backyard, near Drain	Soil	8 oz	No	
3/2 (24")	10:30 am	"	Soil	8 oz	"	
3/3 (45")	10:30 am	"	Soil	8 oz	"	

ACKNOWLEDGEMENT OF FACILITY REPRESENTATIVE

The undersigned acknowledges that the samples described above have been collected.

NAME, TITLE AND ADDRESS OF FACILITY REPRESENTATIVE:
Mustang Industrial Equipment
7607 Wallisville Rd, Houston, Tx. 77020

(Signature)

2/4/81
(Date)

DISTRIBUTION: One copy facility representative
One copy for inspector's records
Original to Regional Office

ATTACHMENT A

Review of "Draft Remedial Action Plan, Wallisville Road Site, Houston, Texas" (Attachment A/1)

The attached remedial action plan was reviewed and considered throughout the accomplishment of tasks under TDD #F-6-8112-22.

In general, we believe that the plan addresses to some extent the emergency elements of the problems existing at the site (specifically: replacement of contaminated soils with clean compacted clay in the easter boundary ditch (Items 1 & 2); similar action along portion of the north end of the site (Item #3); and paving of the center strip with 2" asphalt topping. The proposal is apparently based on partial sample analysis (the only available information prior to submission of the plan). It is only partially successful in offering long range solutions. It is lacking several other elements of a remedial action plan which we consider necessary (Attachment A/2 presents an outline of what we believe is a desirable coverage of such plan).

Specifically, we believe it is necessary to reconsider the plan and supplement it in the following areas:

Action Items 1-4:. Presentation of hydrologic determination of the adequacy of reconstructed drainage courses supported by such details as typical cross-sections showing all dimensions and exact positions of the reconstructed drainage courses.

Other Elements: Exhibit B contains a list of pesticides formulated at the site, but it does not include PCNB (the substance is a fungicide, but is also used for soil treatment. Was it one of the items formulated, or was it used for soil treatment during the reconstruction phase of the sites?) The exhibit does not include solvents which may have been used in the formulation process and disposed on the site.

Exhibit C: Indicates layout of the former plant showing location of toxaphene tank (3) and dry products formulation (4) situated along the northern boundary of the site. This location could indicate more extensive contamination northward from the site than detected during the sampling inspection. Similar considerations would apply to the liquid products formulation (9) and storage areas (8). The exibit also indicate drainage (12) in the south center of the site (presence established during the January 13, 1982, visit).

Exhibit D: Indicates approximate locations and size of two diposal pits. Time-sequential aerial photos of the site indicate larger disposal areas and grater progression of these areas over the years of existence of the Olin facility.

ATTACHMENT A/1

DRAFT

REMEDIAL ACTION PLAN

WALLISVILLE ROAD SITE

HOUSTON, TEXAS

PURPOSE:

The purpose of this plan is to respond to the Environmental Protection Agency's request for a series of remedial measures that will eliminate any potential threat to public health and the environment that may be posed by the migration of residual contaminants from a former pesticide formulation facility.

REMEDIAL ACTION: (See Exhibit A)

The major portion of the property is covered by layers of asphalt, concrete or shell which effectively seal-off any contact betwen rainfall and runoff and residual contaminants in the soil. The character of the surface and immediate subsurface soils and the solubility of the contaminants are such that significant migration of contaminants with groundwater will not occur. The contaminants are not volatile and the same surfaces that prevent surface water contact prevent migration via the air.

This remedial plan provides for the removal of contaminated surface soils from the drainage courses to the north and east of the site and replacement with clean clays. It also provides for capping that portion of the site proper where the original soils are not covered. These measures assure that the site poses no threat to public health or the environment.

It is proposed to remove the contaminated surface soil from the drainways to the north and east of the site and replace it with clean clay. The drainway down the center of the site that is not now covered with concrete, asphalt or shell will be asphalted. The contaminated soil will be disposed of in a secure landfill in accordance with EPA and State regulations.

Specifically, the following actions are proposed:

1. Remove soil from the Houston Belt & Terminal Railway (hereinafter referred to as "Houston Belt") right-of-way consisting of a strip 12 feet wide and averaging 2.5 feet in depth extending from the northeast corner of the property 600 feet south and replace with clean compacted clay. The amount to be removed is approximately 670 cubic yards.
2. Remove soil from the remaining distance of about 500 feet south along the Houston Belt right-of-way consisting of a strip 12 feet wide and averaging 1.5 foot in depth and replace with clean compacted clay. Amount to be removed is approximately 335 cubic yards.
3. Remove soil from the drainway running east and west at the north boundary of the property for a distance of 400 feet west of the northeast corner of the property. The Houston Power and Light Company has an easement in this area. The soil removed will be a 400 foot strip 1.5 foot deep (average) and 8 feet wide which will be replaced with compacted clean clay. The amount to be removed is approximately 175 cubic yards.

4. Emplace a 2" asphalt topping on the unpaved 1,000 foot strip from north end of property on the western boundary of the Southern Pacific Railroad Company (hereinafter referred to as "Southern Pacific") property to the south end of the site. The strip average 15' in width. This would be approximately 1,600 sq. yards of surfacing.

In summary, it is proposed to remove approximately 1,200 cubic yards of soil extending well beyond the critical areas identified in the EPA survey and replace it with clean compacted clays. All removed soil will be disposed of in a secure and an approved landfill. The central drainway will be paved to prevent soil transport by erosion. These actions will remove the potential for and risk to public health or the environment from the residual contaminants at the site. The total cost of this plan is estimated to be $132,450.00. The specific costs are as follows:

1180 yards @ 60.00 per yd. remove, dispose & replace	$ 70,800.
1,667 sq. yds. @ $10.50 2" asphalt surface	17,500.
	$ 88,300.
Contingency, engineering 50%	$ 44,150.
	$132,450.

ENVIRONMENTAL RISK FACTORS:

The principal surface soil type at the Wallisville Road site is the Beaumont clay formation which is overlain locally by clays of low permeability. The significant groundwater sources of the area are in aquifers below the Beaumont clay formation. The low solubility of the contaminants, the low permeability of the surface soils and the impervious

Surface to 6" ATTACHMENT D/3.

Station	DDD	DDE	DDT	Dieldrin	Lindane	Toxaphene	1260 PCB	PCNB
1	ND	ND	2,030,000	ND	ND	<1	ND	<1
2	790	<2,200	7,900	1,500	ND	ND	ND	22,000
3	0.096 mg.		0.030g					
4	140	3400	4200	7300	ND	ND	ND	17
5	125,000	76,000	560,000	ND	ND	1,330,000	ND	69,000
6			1,120,000			3,000,000		27.3,000.
7	43000	15,000	470,000	38,000	ND	ND	ND	120,000
7 dup.	47,000	9,200	540,000 2,180,000	36,000	ND	ND	ND	95,000
8			2,130,000					43?000
9			8.8 mg					
10	10	21	47	ND	ND	ND	ND	1.2
11								
12	20,000	11,500	30,000	6,900	2,900	ND	ND	1,900
13						1,490,000		
14	5 17	15 40	17 180 8240	ND ND	ND ND	ND ND	ND ND	33 5.4
15	ND	ND	47	ND	ND	ND	320	<1.0

6"

12 - 24"

Station	DDD	DDE	DDT	Dieldrin	Lindane	Toxaphene	1260 PCB	PCNB
1			.06 mg					.0031 mg
2						0.389 mg		
3	ND	ND	ND	ND	ND	92	ND	1.8
4			.034 mg					.0027 mg
5						41,300 mg		208 mg
6	20,000	5,800	530,000	24,000	ND	ND	ND	1,700
7	5,200	1,500	89,000	4,300	ND	ND	ND	310,000
8	40	170	4,400	400	ND	ND	ND	3700
9								
10	ND	ND	ND	ND	ND	ND	ND	ND
11								
12	260	ND	56	ND	ND	ND	ND	360
13								
14								
15								

36 - 48"

Station	DDD	DDE	DDT	Dieldrin	Lindane	Terraphene	1260 PCB	PCNB
1	36	9.4	244	21	ND	ND	ND	12
2	ND	ND	ND	ND	ND	134	ND	2.1
3	ND	ND	ND	ND	ND	520	ND	1.3
4	5.5	5.7	97.0	3.4	ND	ND	ND	13
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

EXECUTED SAMPLING PLAN

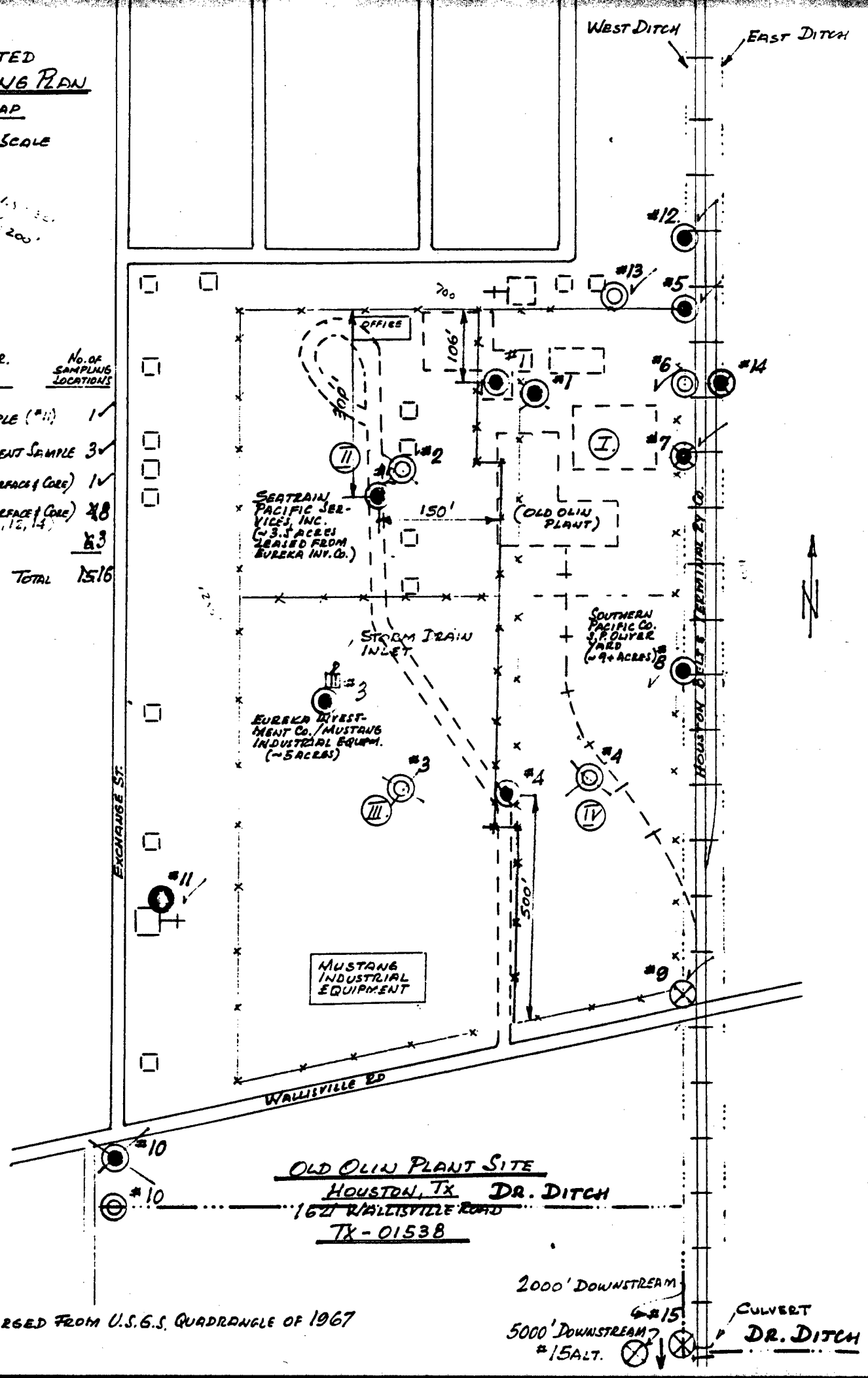
SITE MAP

APPROXIMATE SCALE 1:2400

1" = 200'

LEGEND:

SYMBOLS - DESCR.	No. OF SAMPLING LOCATIONS
WATER SAMPLE (#11)	1 ✓
WATER & SEDIMENT SAMPLE (#9, 15, ALT.)	3 ✓
WATER & SOIL (SURFACE & CORE) (#7)	1 ✓
SOIL SAMPLE (SURFACE & CORE) (#1, 2, 3, 4, 5, 8, 12, 14)	X8
SOIL (CORE) (#6, 10, 13)	X3
TOTAL	15/16



MAP ENLARGED FROM U.S.G.S. QUADRANGLE OF 1967

ATTACHMENT #1

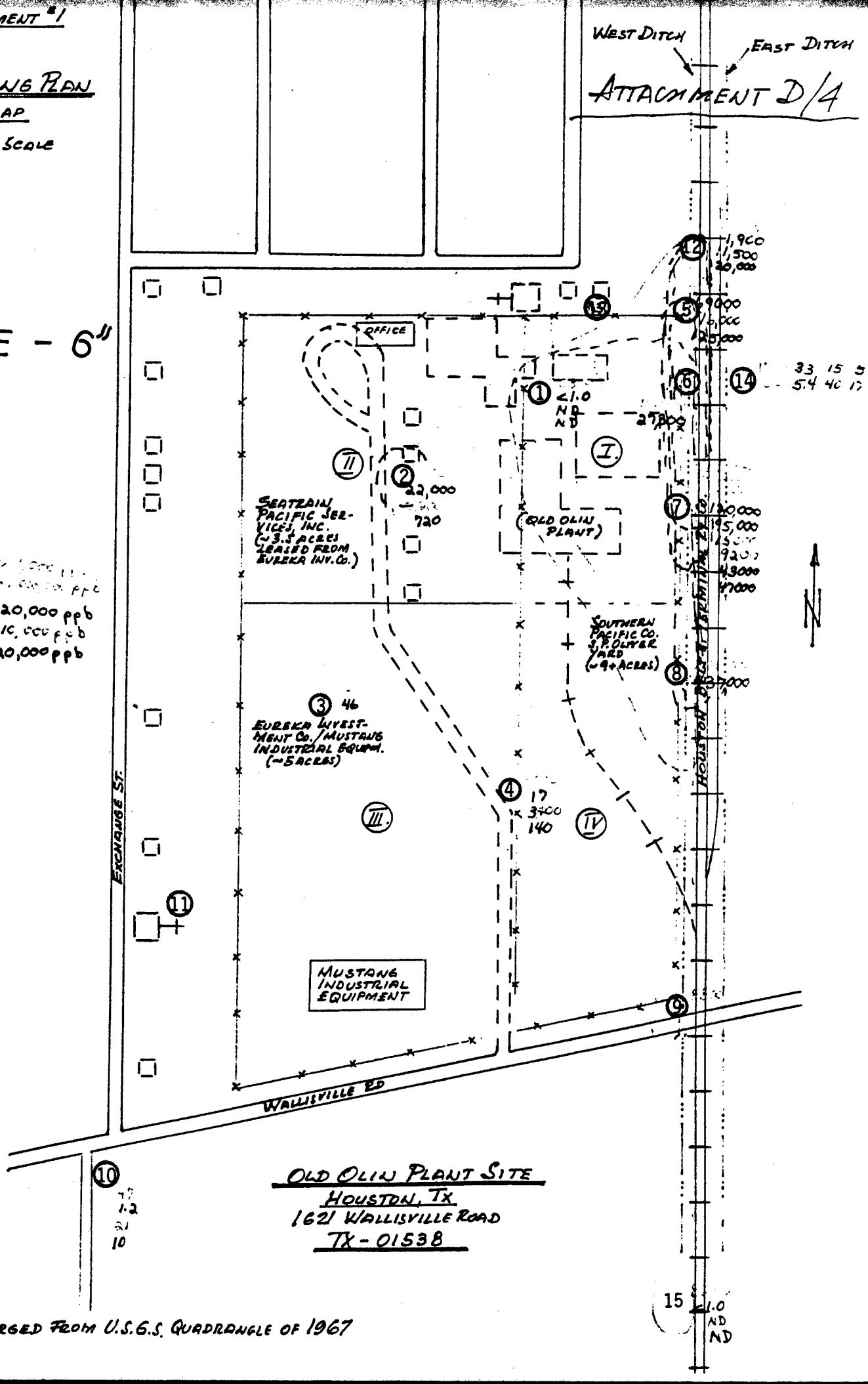
SAMPLING PLAN

SITE MAP

APPROXIMATE SCALE
1:2400

SURFACE - 6"

DDT - - - > [illegible] ppb
PCNB - - - > 20,000 ppb
DDE - - - - - > 10,000 ppb
DDD - - - -> 20,000 ppb



OLD OLIN PLANT SITE
HOUSTON, TX
1621 WALLISVILLE ROAD
TX-01538

MAP ENLARGED FROM U.S.G.S. QUADRANGLE OF 1967

ATTACHMENT 1

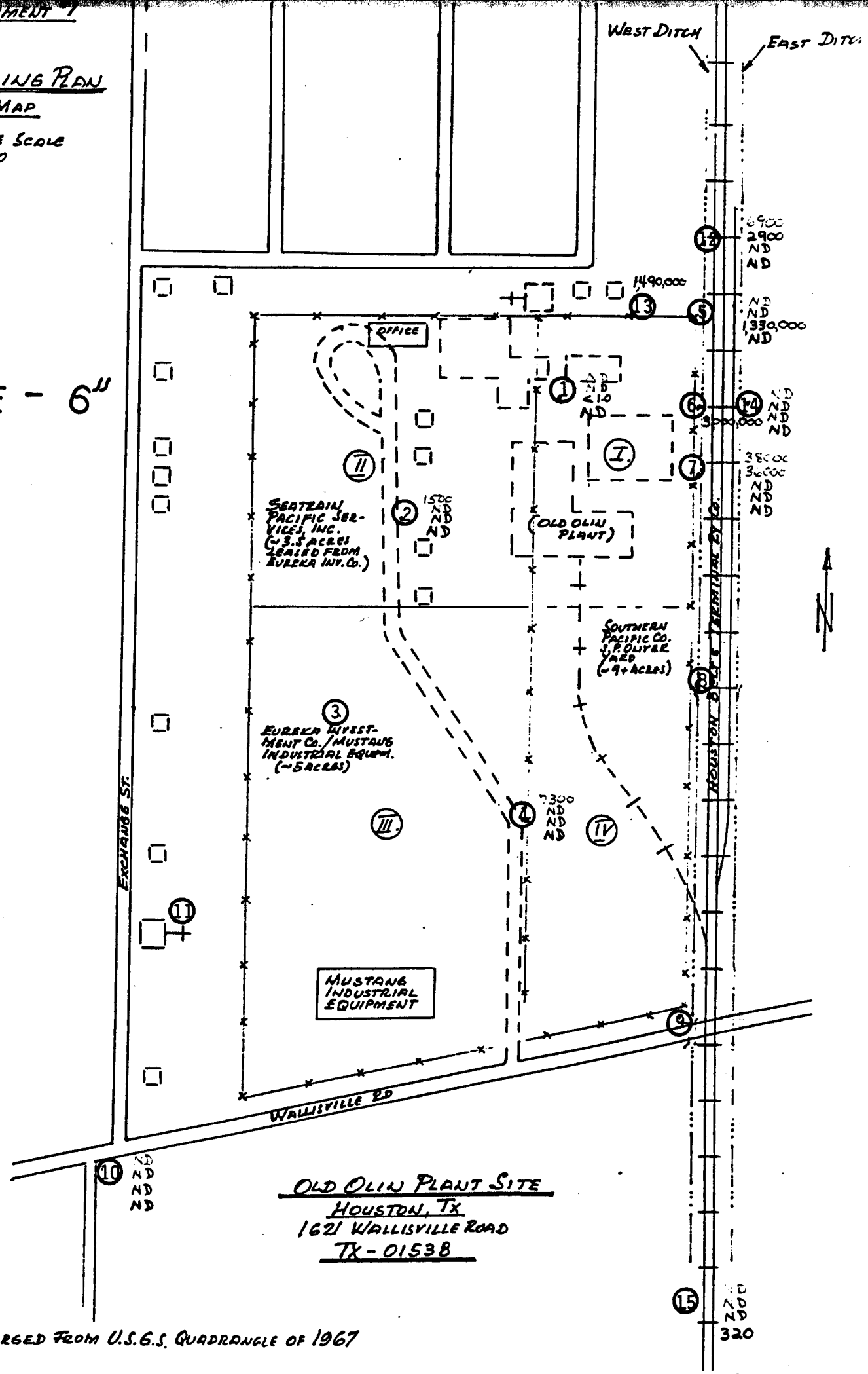
SAMPLING PLAN

SITE MAP

APPROXIMATE SCALE
1:2400

SURFACE - 6"

Dieldrin ppb
Lindane ppb
Toxaphene ppb
PCB-1260 ppb



OLD OLIN PLANT SITE

HOUSTON, TX
1621 WALLISVILLE ROAD
TX-01538

MAP ENLARGED FROM U.S.G.S. QUADRANGLE OF 1967

ATTACHMENT 1

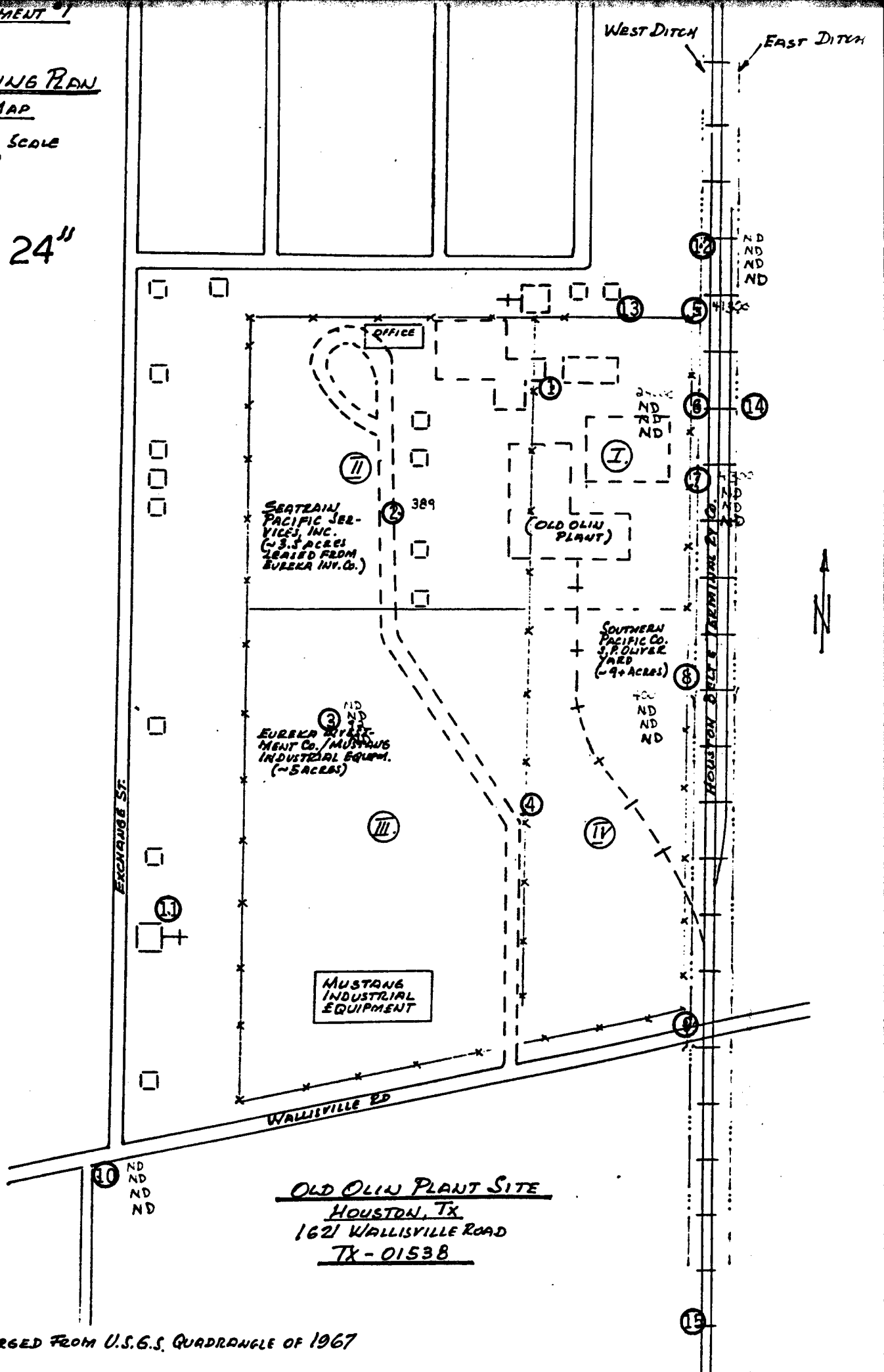
SAMPLING PLAN

SITE MAP

APPROXIMATE SCALE
1:2400

12" TO 24"

Dieldrin ppb
Lindane ppb
Toxaphene ppb
PCB 1260 ppb



OLD OLIN PLANT SITE
HOUSTON, TX
1621 WALLISVILLE ROAD
TX-01538

MAP ENLARGED FROM U.S.G.S. QUADRANGLE OF 1967

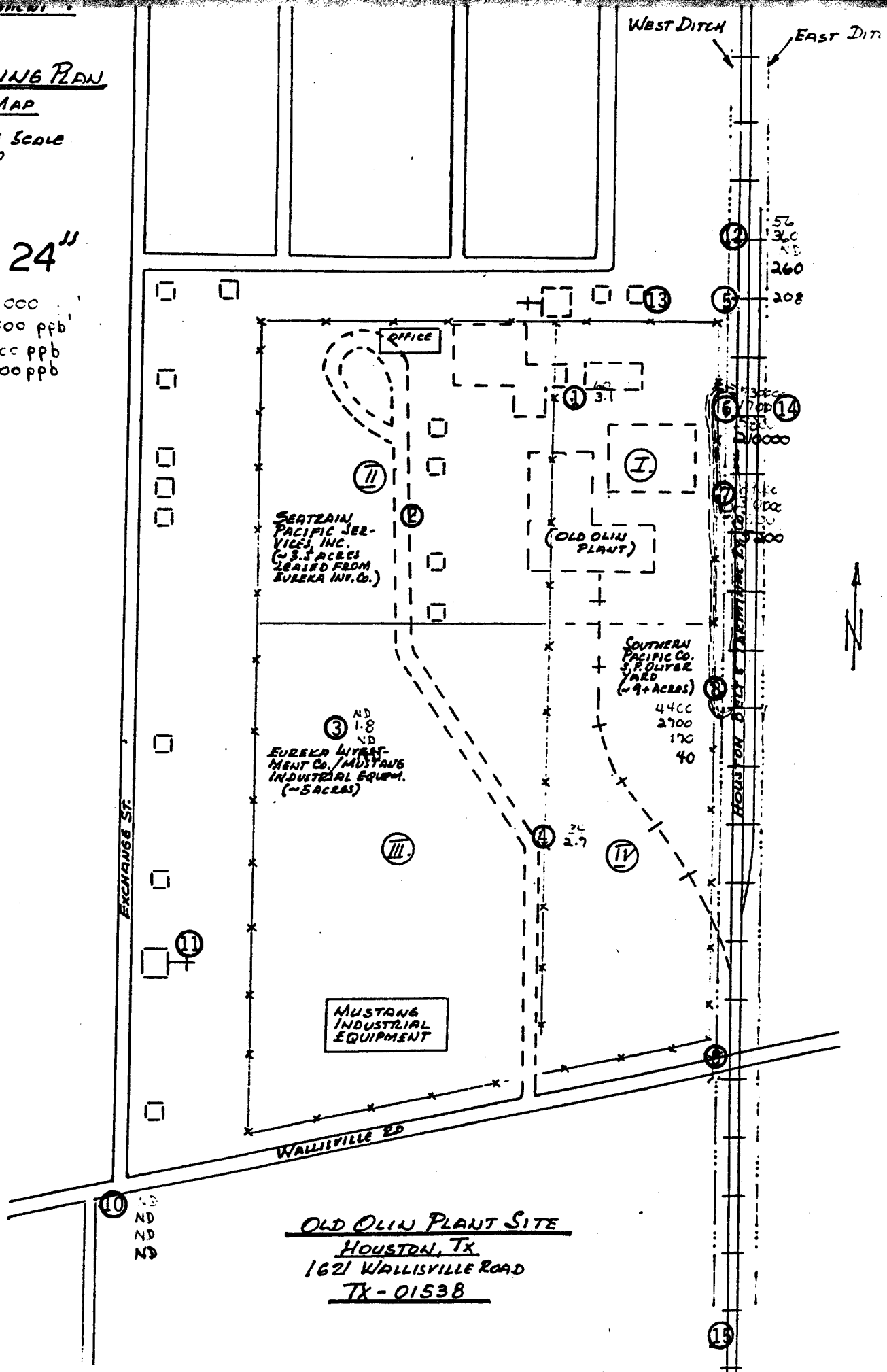
SAMPLING PLAN

SITE MAP

APPROXIMATE SCALE
1:2400

12" TO 24"

DDT - - - > 4000
PCNB ——> 1000 ppb
DDE - - - > 1000 ppb
DDD — - —> 1000 ppb



OLD OLIN PLANT SITE
HOUSTON, TX
1621 WALLISVILLE ROAD
TX-01538

MAP ENLARGED FROM U.S.G.S. QUADRANGLE OF 1967

ATTACHMENT #1

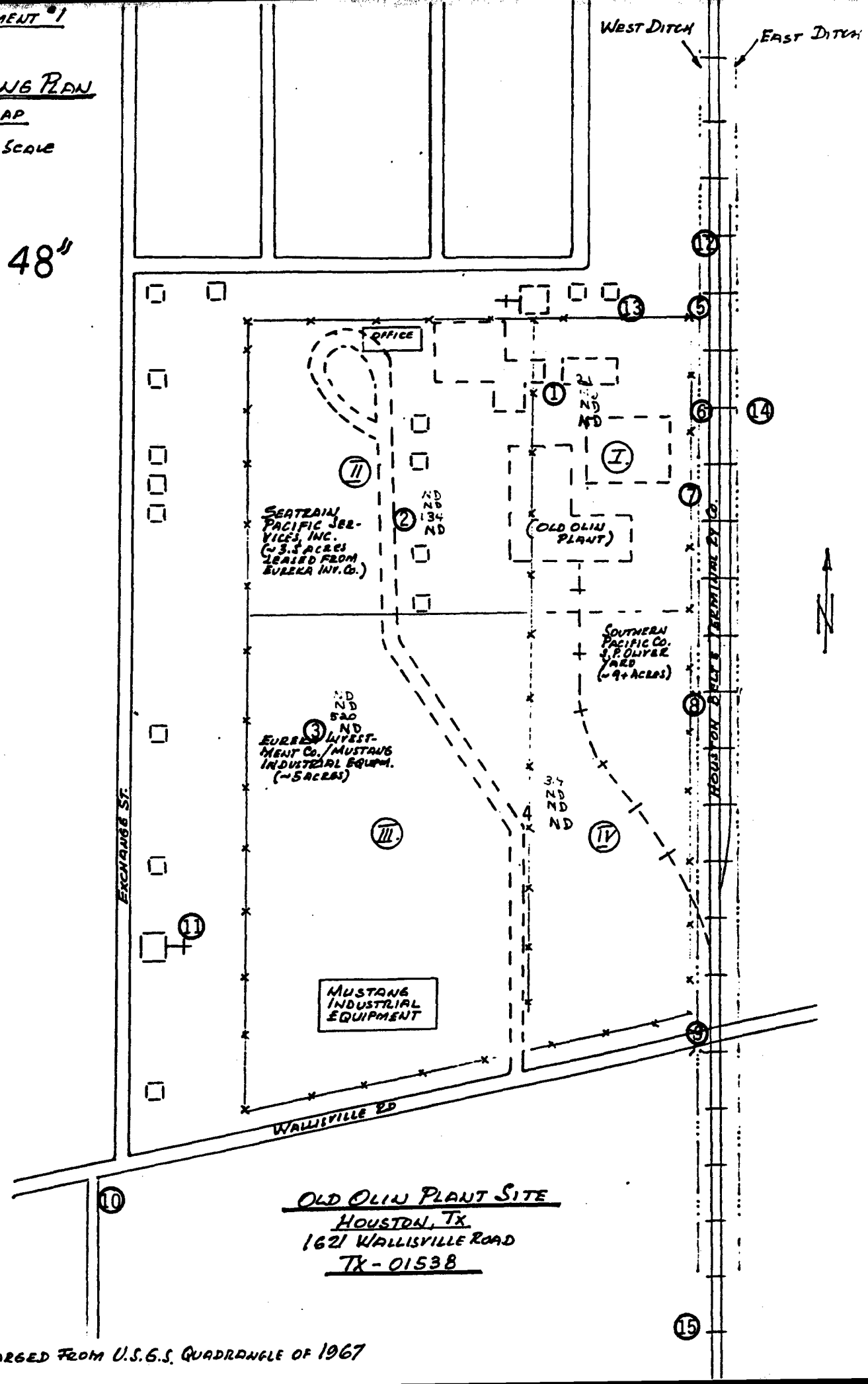
SAMPLING PLAN

SITE MAP

APPROXIMATE SCALE
1:2400

36" TO 48"

Dieldrin fft
Lindane ppb
Toxaphene ppb
PCB 1260 ppb



OLD OLIN PLANT SITE
HOUSTON, TX
1621 WALLISVILLE ROAD
TX-01538

MAP ENLARGED FROM U.S.G.S. QUADRANGLE OF 1967

ATTACHMENT #1

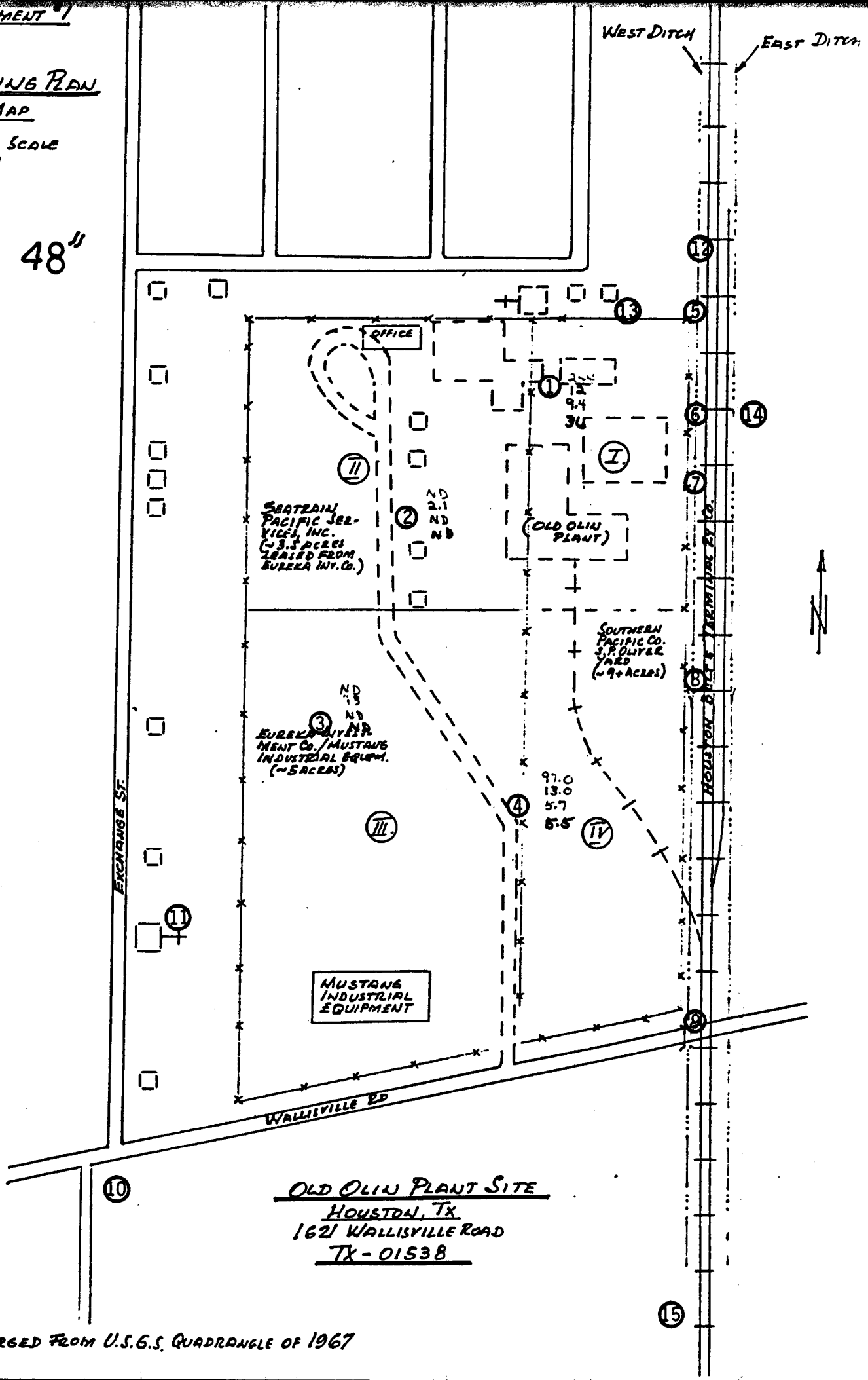
SAMPLING PLAN

SITE MAP

APPROXIMATE SCALE
1:2400

36" TO 48"

DDT ppb
PCNB ppb
LLE ppb
DDD ppb



OLD OLIN PLANT SITE
HOUSTON, TX
1621 WALLISVILLE ROAD
TX-01538

MAP ENLARGED FROM U.S.G.S. QUADRANGLE OF 1967

ATTACHMENT D/ 5

JACOBS LABORATORIES

373 SOUTH FAIR OAKS AVENUE
PASADENA, CALIFORNIA 91105
TELEPHONE (213) 795-7553 (213) 681-4655

FORMERLY PJB LABORATORIES

June 25, 1981

U.S. Environmental Protection Agency
Region VI
1201 Elm Street
Dallas, Texas 75270

Attention: Karen Solari

Dear Ms. Solari:

Enclosed are the results on the 18 soil samples analyzed for chlorinated pesticides and pentachloronitrobenzene. The two samples that are analyzed in duplicate are Tag No. 1213 and Tag No. 1258 as low level and high level samples. The duplicate results will be sent shortly.

If you have any questions, please call me.

Sincerely yours,

David Ben-Hur

David Ben-Hur, Ph.D.
Laboratory Director

jmm

[illegible] Station #1
[illegible] Oliver Yard [illegible]
[illegible]

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-4
Houston Lab No. : 3651
Tag No. : 1216

Station Location: S.P. Oliver Yard - N

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	No	36
p,p'-DDE	No	9.4
p,p'-DDT	No	244
Dieldrin	No	21
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene		12

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-1
Houston Lab No. : 3652
Tag No. : 1206

Station Location: Seatrain Pacific Yard

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	Yes	790
p,p'-DDE	Yes	5,200
p,p'-DDT	Yes	7,900
Dieldrin	No	1,500
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene		22,000

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-5
Houston Lab No. : 3654
Tag No. : 1219

Station Location: Seatrain Pacific Yard

Pesticide	GC/MS confirmed	Concentration, µg/kg dry weight
p,p'-DDD		ND
p,p'-DDE		ND
p,p'-DDT		ND
Dieldrin		ND
Lindane		ND
Toxaphene	No	134
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	2.1

JACOBS LABORATORIES

Sample #3
Mustang Yard
2nd dip

Jacobs Lab No. : P81-05-200-6
Houston Lab No. : 3656
Tag No. : 1220

Station Location: Mustang Yard

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD		ND
p,p'-DDE		ND
p,p'-DDT		ND
Dieldrin		ND
Lindane		ND
Toxaphene	No	92
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	1.8

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-7
Houston Lab No. : 3657
Tag No. : 1222

Station Location: Mustang Yard

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD		ND
p,p'-DDE		ND
p,p'-DDT		ND
Dieldrin		ND
Lindane		ND
Toxaphene	No	520
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	1.3

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-20C-3
Houston Lab No. : 3658
Tag No. : 1215

Station Location: S.P. Oliver Yard - S

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	No	140
p,p'-DDE	No	3,400
p,p'-DDT	No	4,200
Dieldrin	No	7,300
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	17

JACOBS LABORATORIES

Jacobs Lat No. : P81-05-200-2
Houston Lab No. : 3660
Tag No. : 1213

Station Location: S.P. Oliver Yard - S

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	No	5.6
p,p'-DDE	No	5.6
p,p'-DDT	No	46
Dieldrin	No	2.1
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	9.3

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-11
Houston Lab No. : 3661
Tag No. : 1253

Station Location: West Ditch (NE Corner/Surface)

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	Yes	125,000
p,p'-DDE	Yes	76,000
p,p'-DDT	Yes	560,000
Dieldrin		ND
Lindane		ND
Toxaphene	Yes	1,330,000
PCB Aroclor-1260		ND
Pentachloronitrobenzene	Yes	69,000

Q3+-1013

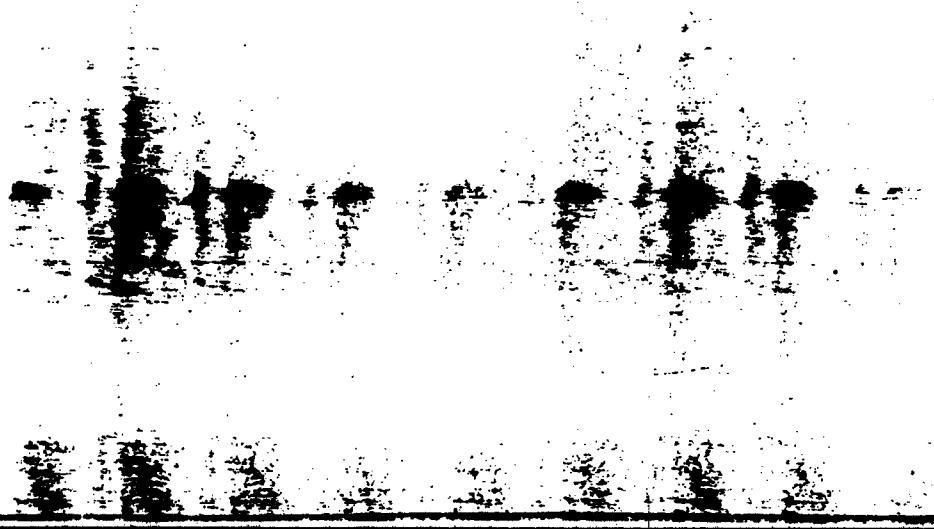
JACOBS LABORATORIES

Sample Location #6
100' S. of N.E. Corner
24" deep

Jacobs Lab No. : P81-05-200-12
Houston Lab No. : 3664
Tag No. : 1256

Station Location: West Ditch (S. of NE Corner)

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	Yes	210,000
p,p'-DDE	Yes	5,800
p,p'-DDT	Yes	530,000
Dieldrin	Yes	24,000
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	1,700



JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-13
Houston Lab No. : 3665
Tag No. : 1258

Station Location: West Ditch (S. of NE Corner)

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	Yes	43,000
p,p'-DDE	Yes	15,000
p,p'-DDT	Yes	470,000
Dieldrin	Yes	38,000
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	Yes	120,000

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-14
Houston Lab No. : 3666
Tag No. : 1260

Station Location: West Ditch (S. of NE Corner)

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	Yes	5,200
p,p'-DDE	Yes	1,500
p,p'-DDT	Yes	89,000
Dieldrin	No	4,300
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	Yes	310,000

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-17
Houston Lab No. : 3669
Tag No. : 1265

Station Location: West Ditch (S. of NE Corner)

Pesticide	GC/MS confirmed	Concentration, µg/kg dry weight
p,p'-DDD	No	40
p,p'-DDE	No	170
p,p'-DDT	Yes	4,400
Dieldrin	No	400
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	Yes	2,700

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-18
Houston Lab No. : 3671
Tag No. : 1275

Station Location: South Ditch

Pesticide	GC/MS confirmed	Concentration, µg/kg dry weight
p,p'-DDD	No	10
p,p'-DDE	No	21
p,p'-DDT	No	47
Dieldrin		ND
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	1.2

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-9
Houston Lab No. : 3673
Tag No. : 1251

Station Location: West Ditch (Surface)

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	Yes	20,000
p,p'-DDE	Yes	11,500
p,p'-DDT	Yes	30,000
Dieldrin	Yes	6,900
Lindane	Yes	2,900
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	1,900

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-10
Houston Lab No.: 3674
Tag No. : 1252

Station Location: West Ditch (12" deep)

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	No	260
p,p'-DDE		ND
p,p'-DDT	No	56
Dieldrin		ND
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	360

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-15
Houston Lab No. : 3676
Tag No. : 1263

Station Location: East Ditch (S. of NE Corner)

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	No	17
p,p'-DDE	No	40
p,p'-DDT	No	180
Dieldrin		ND
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	5.4

JACOBS LABORATORIES

Jacobs Lab No. : P31-05-200-16
Houston Lab No. : 3677
Tag No. : 1264

Station Location: East Ditch (S. of NE Corner)

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	No	5
p,p'-DDE	No	15
p,p'-DDT	No	17
Dieldrin		ND
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	33

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1201 ELM STREET
DALLAS, TEXAS 75270

2/3/81
(Date)

RECEIPT FOR SAMPLES

NAME AND TITLE OF EPA REPRESENTATIVE: IMRE SEKELYHIDI
ECOLOGY & ENV. INC. DALLAS, TX

(Signature)

SAMPLES COLLECTED:

	SAMPLE NUMBER	TIME	PLACE COLLECTED	TYPE	VOLUME	SPLIT SAMPLE REQUESTED	SPLIT SAMPLE PROVIDED
2/3/81	5	10:45-10:50 AM	SURFACE & 24" (2)	SOIL	8oz	NO	
	6	11:00-11:05 AM	6" AND 24" (2)	"	"	"	
	7	11:30-11:45 AM	SURFACE 3-5" & 24" (3)	"	"	"	
	8	2:25 PM	SURFACE & 24" (2)	"	"	"	
	9	3:00 PM	WATER (1) SURFACE (1)	WATER & SOIL	1 GAL & 8oz	"	
	12	10:25-10:30 AM	SURFACE & 12" (2)	SOIL	8oz	"	
	14	2:05 PM	SURFACE & 6" (2)	"	"	"	
2/4/81	15	1:30 PM	WATER (1) SURFACE (1)	WATER & SOIL	1 GAL & 8oz		
	15 ALT	10:15 AM	WATER (1) SURFACE (1)	"	"		

ACKNOWLEDGEMENT OF FACILITY REPRESENTATIVE

The undersigned acknowledges that the samples described above have been collected.

NAME, TITLE AND ADDRESS OF FACILITY REPRESENTATIVE:

J.E. MARTIN, CHIEF ENGINEER, H&TRy. Co.
501 CRAWFORD ST. HOUSTON, TEXAS 77002

(Signature)

2-3-81
(Date)

DISTRIBUTION: One copy facility representative
One copy for inspector's records
Original to Regional Office

INFORMATION BELOW WAS PROVIDED BY MR. TERRY FISCHER OF THE CITY OF HOUSTON HEALTH DEPARTMENT

RESIDENTIAL WELL SAMPLING INFORMATION

(b) (6)

[redacted]

2. Date well was dug 35-40 years ago

3. Depth of well 65 ft

4. Depth to static water ______

5. Is the well cased? Yes______ No______

If so, to what depth? ______

What type of casing is used? ______

NO INFORMATION IS AVAILABLE

6. Is well screened? Yes______ No______

7. How much is the well pumped? (Only for residential use or for use in watering livestock?) Bathroom usage only; bottled drinking water brought in.

8. Any other pertinent information? Well still in use [illegible]

[illegible] bathroom

The [illegible]

* Sewage given to area October 1976

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

REGION 6
First International Bldg., 1201 Elm St.
Dallas, Texas 75270

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
SAMPLERS: *(Signature)*	

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

VIR...EN RO...ON ICY
Office of Enforcement

REGION 6
First International Bldg., 1201 Elm St.
Dallas, Texas 75270

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME

SAMPLERS: *(Signature)*

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

REGION 6
First International Bldg., 1201 Elm St.
Dallas, Texas 75270

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
SAMPLERS: *(Signature)*	

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
5208 NNWOOD DRIVE · HOUSTON, TEXAS 77074

ATTACHMENT D/1.

DATE: April 6, 1981

SUBJECT: Laboratory Report: Oliver Yard, Old Olin Site; Houston, Texas, TX 01538

FROM: William D. Langley, Chief
Laboratory Services Section, 6ASAHL

TO: William J. Librizzi, Director
Laboratory Services Section, 6ASA

Thru: Malcolm F. Kallus, Chief, Houston Branch, 6ASAH

Thirty-one soil and one water samples were collected by FIT personnel at the subject site on February 2, 3, and 4, 1981, and received at the Houston Laboratory on February 4 and 5. We were requested to hold these samples pending determination of analyses desired and priority. Subsequently we were requested to perform pesticides analysis on 12 of these samples and a complete screening of a 13th sample. The complete screening has not been completed, but the results of pesticide fraction analyses are presented below. All concentrations in the soils are reported on a dry weight basis.

1. HNB Laboratory No. 3649; Tag No. 6-1218

Source: Oliver Yard, Olin Site, 106' south of north fence.
S. P. Oliver Yard, surface soil.

Time/Date Collected: 1200 hours; 2/4/81.

p, p' - DDT	2,030 mg/kg (ppm)

Toxaphene and pentachloronitrobenzene (PCNB) were also present but unable to determine concentration due to presence of interfering substances.

2. HNB Laboratory No. 3650; Tag No., 6-1217

Source: S. P. Oliver Yard, 24" deep sample, 106' south of north fence.

Time/Date Collected: 1214 hours, 2/4/81.

p, p' - DDT	0.06 mg/kg (ppm)
PCNB	0.0031 "

3. HNB Laboratory No. 3653; Tag No. 6-1207

Source: Sea train, Pacific Lot, 2' deep.

Time/Date Collected: 1130 hours; 2/4/81

Toxaphene	C.389 mg/kg (ppm)

PCNB present at lesser concentration but not calculated. (Precise concentration would require more extensive analysis).

4. HNB Laboratory No. 3655; Tag No. 6-1221

Source: Mustang Ind. Equipment. Surface sample.

Time/Date Collected: 0950 hours; 2/4/81.

p,p' - DDT	0.030 mg/kg (ppm)
p,p - DDD	0.046 "

5. HNB Laboratory No. 3659; Tag No. 6-1214

Source: S. P. Oliver Yard, 500'S. of N. Fence at 24" depth.

Time/Date Collected: 1245 hours; 2/4/81.

p,p' - DDT	0.034 mg/kg (ppm)
PCNB	0.0027 "

6. HNB Laboratory No. 3662; Tag No. 6-1257

Source: West ditch, northeast corner of site, 24" depth.

Time/Date Collected: 1050 hours; 2/3/81.

Toxaphene	41,300 mg/kg (ppm)
PCNB	208 "

7. HNB Laboratory No. 3663; Tag No. 6-1255

Source: West ditch, 100' south of northeast corner, east of site, 6" depth.

Time/Date Collected: 1105 hours; 2/3/81.

Toxaphene	3,000 mg/kg (ppm)
p,p' - DDT	1,120 "
PCNB	27.3 "

8. HNB Laboratory No. 3667; Tag No. 6-1259

Source: West ditch, 200' south of northeast corner, 3" to 5" depth.

Time/Date Collected: 1145 hours; 2/3/81.

p,p' - DDT	2,180 mg/kg (ppm)

PCNB also present at lesser concentration but not calculated. (Precise determination would require more extensive analysis).

9. HNB Laboratory No. 3668; Tag No. 6-1266 ✓

Source: West ditch, 500' south of northeast corner.

Time/Date Collected: 1425 hours; 2/2/81.

p,p' - DDT	2,130 mg/kg (ppm)
PCNB	437 "

10. HNB Laboratory No. 3670; Tag No. 6-1276 ✓

Source: West ditch; 1000' south of northeast corner (southeast corner).

Time/Date Collected: 1500 hours; 2/3/81.

p,p' - DDT	8.81 mg/kg (ppm)

A second portion of this sample was extracted and analyzed as a duplicate sample. Found p,p' - DDT at 2.59 mg/kg (ppm).

11. HNB Laboratory No. 3672; Tag No. 6-1277 ✓

Source: South ditch, southeast corner of Wallisville Exchange Road.

Time/Date Collected: 1530 hours; 2/3/81.

No pesticides detected at detection limit of 0.017 mg/kg (ppm).

12. HNB Laboratory No. 3675; Tag No. 6-1254

Source: Wash north of fence, 82' north of northeast corner, 6" below surface.

Time/Date Collected: 1055 hours; 2/3/81.

Toxaphene	1,490 mg/kg (ppm)

13. HNB Laboratory No. 3675; Tag No. 6-1254

Source: 1000' south of Wallisville Road, 50' north of Culvert under railroad track.

Time/Date Collected: 1330 hours; 2/4/81.

p,p' - DDT	8.24 mg/kg (ppm)

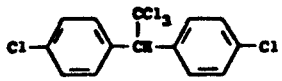
A complete, priority pollutant screening requested for this sample has not been finished at this time.

William D Langley

William D. Langley

ATTACHMENT D/2

2822. DDT. *1,1'-(2,2,2-Trichloroethylidene)bis[4-chlorobenzene]; 1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane;* α,α-bis(*p*-chlorophenyl)-β,β,β-trichloroethane; dichlorodiphenyltrichloroethane; chlorophenothane; dicophane; pentachlorin; *p,p'*-DDT; Gesarol; Neocid. $C_{14}H_9Cl_5$; mol wt 354.50. C 47.43%, H 2.56%, Cl 50.01%. Polychlorinated nondegradable pesticide. Prepd by condensing chloral or chloral hydrate with chlorobenzene: Zeidler, *Ber.* 7, 1180 (1874). The catalyst may be fuming H_2SO_4 or chlorosulfonic acid: Rueggeberg, Torrans, *Ind. Eng. Chem.* 38, 211 (1946); Cook *et al., ibid.* 39, 868, 1683 (1947). Convenient lab procedures: Bailes, *J. Chem. Ed.* 22, 122 (1945); Ginsburg, *Science* 108, 339 (1948). Large scale production: Mosher *et al., Ind. Eng. Chem.* 38, 916 (1946). Comprehensive monograph (in English and German): *DDT*, Paul Müller, Ed., 3 vols (Birkhäuser Verlag, Basel and Stuttgart, 1955).



Biaxial elongated tablets, needles from 95% alc. mp 108.5-109°. uv max (95% alc): 236 nm. Vapor pressure at 20° = 1.5×10^{-7} mm Hg. Practically insol in water, dil acids, alkalies. Soly in 100 ml of acetone = 58 g; benzene = 78 g; benzyl benzoate = 42 g; carbon tetrachloride = 45 g; chlorobenzene = 74 g; cyclohexanone = 116 g; 95% alc = 2 g; ethyl ether = 28 g; gasoline = 10 g; isopropanol = 3 g; kerosene = 8-10 g; morpholine = 75 g; peanut oil = 11 g; pine oil = 10-16 g; tetralin = 61 g; tributyl phosphate = 50 g; freely sol in pyridine, dioxane. The soly in organic solvents increases sharply with a rise in temp, *cf.* D. E. H. Frear, *Chemistry of Insecticides, Fungicides, Herbicides*, 3rd ed. (New York, 1955). Resistant to destruction by light and oxidation. Its unusual stability has resulted in difficulties in residue removal from water, soil and foodstuffs. DDT should not be kept in iron containers and should not be mixed with iron and aluminum salts nor with alkaline substances. High storage temps should also be avoided. Technical grades of DDT are mixtures of several similar compounds and have a setting point of about 88°, *cf.* Haller *et al., J. Am. Chem. Soc.* 67, 1591 (1945). LD_{50} orally in rats: 200 mg/kg.

Human Toxicity: Poisoning may occur by ingestion or by absorption through skin or respiratory tract. *Acute:* tremors of head and neck muscles, tonic and clonic convulsions, cardiac or respiratory failure, death. Estimated oral fatal dose 500 mg/kg body wt of the solid material. Solvents such as kerosene increase toxicity. Death occurs in 2 to 24 hrs. *Chronic:* hepatic damage, CNS degeneration, agranulocytosis, dermatitis, weakness, convulsions, coma, death.

USE: Contact insecticide (most important in *Anopheles* control): P. Müller, Swiss pat. 226,180 (1940); U.S. pat. 2,329,074 (1944 to Geigy); Läuger *et al., Helv. Chim. Acta* 27, 892 (1944); Müller, *ibid.* 29, 1560 (1946). *See also* the 3 vol. monograph edited by Müller, *loc. cit.*

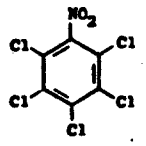
THERAP CAT: Pediculicide; insecticide.

9252. Toxaphene. Chlorinated camphene; synthetic 3956; Alltox; Geniphene; Penphene; Phenacide; Phenatox; Toxakil. A very complex, but reproducible mixture of at least 175 C_{10} polychloro derivs., having an approx overall empirical formula of $C_{10}H_{10}Cl_8$. Produced by the chlorination of camphene to 67-69% chlorine by weight and made up of compds of $C_{10}H_8Cl_{10}$, $C_{10}H_{10-n}Cl_n$ (mostly polychlorobornanes) and $C_{10}H_{14-n}Cl_n$ (polychlorobornenes and/or polychlorotricyclenes) with n = 6 to 9. Prepn: Buntin, U.S. pat. 2,565,471 (1951 to Hercules Powder). Isoln of components in crystalline form: Casida *et al., Science* 183, 520 (1974). *Review:* Liebmann *et al., Arch. Pflanzenschutz* 7, 131-150 (1971).

Yellow waxy solid, mp 65-90°. Pleasant piney odor. Dehydrochlorinates in the presence of alkali, prolonged exposure to sunlight, and at temps about 155°. Practically insol in water; freely sol in aromatic hydrocarbons. LD_{50} orally in rats: 69 mg/kg; orally in dogs: 20-30 mg/kg.

USE: Insecticide. Used against army worms, boll weevil, bollworm, cotton aphid, cotton flea hopper, cotton leafworm, grasshopper, rapid plant bug, southern green stink bug, tarnished plant bug, thrips. *Compare* Strobane. Not recommended for use in dairy barns or on milking animals. *Caution:* Can cause mild irritation of, and be absorbed through, skin. Causes CNS stimulation with tremors, convulsions, death. Liver injury has been reported in exptl animals.

7903. Quintozene. Pentachloronitrobenzene; PCNB; terrachlor; PKhNB; Avicol; Botrilex; Brassicol; Folosan; Terraclor; Tilcarex; Tritisan. $C_6Cl_5NO_2$; mol wt 295.36. C 24.40%, Cl 60.03%, N 4.74%, O 10.83%. Prepd by treating pentachlorobenzene with fuming nitric acid: Jungfleisch, *Ann. Chim.* [4] 15, 286 (1868); Roedig, Kiepert, *Ann.* 593, 71 (1955).



Fine needles from alcohol, platelets from carbon disulfide. d_4^{25} 1.718. mp 144°. bp_{746} 328° (some decompn). Practically insol in water, cold alcohol. Freely sol in carbon disulfide, benzene, chloroform. LD_{50} orally in rats: > 12 g/kg.

USE: Fungicide for seed and soil treatment.

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-8
Houston Lab No. : 3680
Tag No. : 1223 ✓

Station Location: S. of NE Corner (Rec Water)

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD		ND
p,p'-DDE		ND
p,p'-DDT		ND
Dieldrin		ND
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260	No	320
Pentachloronitrobenzene	No	<1.0

JACOBS LABORATORIES

373 SOUTH FAIR OAKS AVENUE
PASADENA, CALIFORNIA 91105
TELEPHONE (213) 795-7553 (213) 681-4655

FORMERLY PJB LABORATORIES

ATTACHMENT FIT D/6

July 16, 1981

U.S. Environmental Protection Agency
Region VI
1201 Elm Street
Dallas, Texas 75270

Attention: Karen Solari

Dear Ms. Solari:

Enclosed are results of duplicates run on samples previously analyzed and reported. The results of the performance evaluation samples are also included.

Sincerely yours,

David Ben-Hur

David Ben-Hur, Ph.D.
Laboratory Director

jmm

cc: Dr. Frank Biros

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-13-duplicate
Houston Lab No. : 3665
Tag No. : 1258

Station Location: West Ditch (S. of NE Corner)

Pesticide	GC/MS confirmed	Concentration, ug/kg dry weight
p,p'-DDD	Yes	47,000
p,p'-DDE	Yes	9,200
p,p'-DDT	Yes	540,000
Dieldrin	Yes	36,000
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene		95,000

JACOBS LABORATORIES

Jacobs Lab No. : P81-05-200-2-duplicate
Houston Lab No. : 3660
Tag No. : 1213

Station Location: S.P. Oliver Yard - S

Pesticide	GC/MS comfirmed	Concentration- µg/kg dry weight
p,p'-DDD	No	5.5
p,p'-DDE	No	5.7
p,p'-DDT	No	97
Dieldrin	No	3.4
Lindane		ND
Toxaphene		ND
PCB Aroclor-1260		ND
Pentachloronitrobenzene	No	13

Form Approved
O.M.B. No. 158-R 0025

US Environmental Protection Agency
Environmental Monitoring and Support Laboratory - Cincinnati

Water Supply Quality Control Check Samples

DATA REPORT FORM
Sheet 2

Chlorinated Hydrocarbon Pesticides, µg/liter

Pesticides	Tap Water Blank	Sample 3 Plus Blank	Sample 3 Less Blank	Sample 4 Plus Blank	Sample 4 Less Blank
Endrin	0	1.6	1.6	0	0
Lindane	0	0.67	0.67	0	0
Methoxychlor	0	84	84	0	0
Toxaphene	0	0	0	7.6	7.6

Comments _____

Laboratory Jacobs

Analyst Sally Muir, Linda Brack Date 7/7/81

EPA-236-1 (Cin)
(4-73)

WS
478

toxicon
laboratories, inc.

3213 MONTERREY BLVD., BATON ROUGE, LA. 70814, TEL. (504) 925-5012

MAY 1 1 1981

ATTACHMENT D/7

In collecting the data and preparing the report for Case 397, we at Toxicon have, to the best of our ability, adhered as closely as possible to EPA protocol in analyzing the volatile organics, base-neutral, acid and pesticide fractions.

Toxicon recently received a critique of our reporting format from Paul Mills. In preparing this report, we have attempted to make the necessary modifications. Any further suggestions for improving our reporting would be greatly appreciated.

As noted, it was necessary to utilize the CNORM program in order to meet the EPA criteria for p-bromofluorobenzene and DFTPP. Other notes pertinent to the data have been integrated into the report where applicable.

Rosalind M. Segesta

Sample Num
Method Blo
Case 397

ORGANICS ANALYSIS DATA SHEET - Page 2

LABORATORY NAME Ionicon

LAB SAMPLE ID NO. 708/0

MAY 1 1 1988

QC REPORT NO. 4

	VOLATILES	ug/l
2V	acrolein	ND
3V	acrylonitrile	ND
4V	benzene	ND
6V	carbon tetrachloride	ND
7V	chlorobenzene	*
10V	1,2-dichloroethane	ND
11V	1,1,1-trichloroethane	ND
13V	1,1-dichloroethane	ND
14V	1,1,2-trichloroethane	ND
15V	1,1,2,2-tetrachloroethane	ND
16V	chloroethane	ND
19V	2-chloroethylvinyl ether	ND
23V	chloroform	ND
29V	1,1-dichloroethylene	ND
30V	1,2-trans-dichloroethylene	ND
32V	1,2-dichloropropane	ND
33V	1,3-dichloropropylene	ND
38V	ethylbenzene	ND
44V	methylene chloride	*
45V	methyl chloride	ND
46V	methyl bromide	ND
47V	bromoform	ND
48V	dichlorobromomethane	ND
49V	trichlorofluoromethane	ND
50V	dichlorodifluoromethane	ND
51V	chlorodibromomethane	ND
85V	tetrachloroethylene	ND
86V	toluene	*
87V	trichloroethylene	ND
88V	vinyl chloride	ND

	PESTICIDES	U
89P	aldrin	ND
90P.	dieldrin	ND
91P	chlordane	ND
92P	4,4'-DDT	** 0.4.
93P	4,4'-DDE	** 0.10
94P	4,4'-DDD	ND
95P	-endosulfan	ND
96P	-endosulfan	ND
97P	endosulfan sulfate	ND
98P	endrin	ND
99P	endrin aldehyde	ND
100P	heptachlor	ND
101P	heptachlor epoxide	ND
102P	-BHC	ND
103P	-BHC	ND
104P	-BHC	ND
105P	-BHC	ND
106P	PCB-1242	ND
107P	PCB-1254	ND
108P	PCB-1221	ND
109P	PCB-1232	ND
110P	PCB-1248	ND
111P	PCB-1260	ND
112P	PCB-1016	ND
113P	toxaphene	ND

	DIOXINS	
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

*Less than 10 ug/l
(pesticides less than 0.[illegible] ug/l)

U.S. ENVIRONMENTAL PROTECTION AGENCY - HWI Sample Management Office
P.O. Box 818, Alexandria, VA 22313 - 703/683-0885

MAY 11 1991

Sample Number
Method Blank
Case 397

ORGANICS ANALYSIS DATA SHEET

LABORATORY NAME Jacobs

LAB SAMPLE ID NO. 708/0

QC REPORT NO. 4

This method blank for acid base/neutrals, volatiles, and pesticides encompasses samples F0316, F0317, F0318, F0319.

	ACID COMPOUNDS	ug/l
21A	2,4,6- trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2- chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4- dimethylphenol	ND
57A	2- nitrophenol	ND
58A	4- nitrophenol	ND
59A	2,4- dinitrophenol	ND
60A	4,6- dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	ug/l
1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4- trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3'-dichlorobenzidine	ND
35B	2,4- dinitrotoluene	ND
36B	2,6- dinitrotoluene	ND
37B	1,2- diphenylhydrazine (as azobenzene)	ND
39B	fluoranthene	ND
40B	4- chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis (2-chloroisopropyl) ether	ND
43B	bis (2-chloroethoxy) methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	ND
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis (2-ethylhexyl) phthalate	*
67B	butyl benzyl phthalate	ND
68B	di-n-butyl phthalate	ND
69B	di-n-octyl phthalate	ND
70B	diethyl phthalate	*
71B	dimethyl phthalate	*
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	indeno(1,2,3-cd)pyrene	ND
84B	pyrene	ND

Lab Name: Lexicon

QC Report No: 4

MAY 1 1 1988

Sample Number: Method Blank Case 397

A. SURROGATE SPIKE RESULTS

COMPOUND	Fraction	Conc. (ug/l)	(Surrogates only) Spike Added (ug/l)	(Surrogates only) % Recovery
d_6-benzene	VO	95.3	100	95
d_8-toluene	VO	92.7	100	93
d_6-phenol	A	52.5	100	53
2-fluorophenol	A	62.8	100	63
2-fluorobiphenyl	B/N	63.0	100	63
d_5-pyridine	B/N	ND*	100	0
d_5-nitrobenzene	B/N	73.2	100	73
d_8-naphthalene	B/N	66.7	100	67

B. TENTATIVELY IDENTIFIED COMPOUNDS

	CAS #	COMPOUND NAME	Fraction	% Maximum Score Attained Mass Matching Routine: Probability Based Search (Forward) (specify)
1.	00005-41059	Hexamethylcyclotrisiloxane	VO	85.5
2.		carbon dioxide (from LSC-II)	VO	
3.	00000-84662	diethyl phthalate	A	98.2
4.		a trimethylsilane derivative**	A	96.4
5.		a trimethylsilane derivative**	A	96.4
6.	00276-54263	bis (2-ethylhexyl) phthalate	A	85.2
7.	00000-31446	4,8,12-trimethyl-3,7,11-tridecatrienenitrile	A	97.9
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.		**Possibly septum bleed		
18.				
19.				

QUALITY CONTROL REPORT

B. DUPLICATE ANALYSIS

COMPOUND (including surrogates)		CONCENTRATION (ug/l)		Relative Percent Difference (RPD)*
P. P. #	COMPOUND NAME	Aliquot 1 (D_1)	Aliquot 2 (D_2)	

This QC Report also covers the following sample numbers: _____

$$*RPD = \frac{(D_1 - D_2)}{[(D_1 + D_2)/2]} \times 100$$

Report No: 4

11 1981

Sample Number
F0319
Case 397

A. SURROGATE SPIKE RESULTS

COMPOUND	Fraction	Conc. (ug/l)	(Surrogates only) Spike Added (ug/l)	(Surrogates only) % Recovery
d_6-benzene	VO	98.4	100	98
d_8-toluene	VO	96.8	100	97
d_6-phenol	A	24.0	100	24
2-fluorophenol	A	38.7	100	39
2-fluorobiphenyl	B/N	41.1	100	41
d_5-pyridine	B/N	ND*	100	0
d_5-nitrobenzene	B/N	44.6	100	45
d_8-naphthalene	B/N	49.4	100	49

B. TENTATIVELY IDENTIFIED COMPOUNDS

	CAS #	COMPOUND NAME	Fraction	% Maximum Score Attained Mass Matching Routine: Probability Based Search (Forward) (specify)
1.	00005-56672	Octamethylcyclotetrasiloxane	VO	98.2
2.	00005-41059	Hexamethylcyclotrisiloxane	VO	85.5
3.	00000-84662	diethyl phthalate	A	98.2
4.	00016-22731	1,3,3-trimethyl-bicyclo [2.2.1] heptan-2-ol	B/N	98.1
5.	00001-24765	Bicyclo [2.2.1] heptan-2-ol, 1,7,7-trimethyl-, exo-	B/N	85.4
6.	—	A compound resembling	B/N	
7.		1-methyl-3(1-methyl-		
8.		ethenyl) cyclohexene - no		
9.		definitive library search		
10.		could be obtained		
11.	00275-54363	bis (2-ethylhexyl) phthalate	A	85.3
12.	00017-40198	1-phenanthrenecarboxylic	A	98.2
13.		acid, 1,2,3,4,4a,9,10,10a-		
14.		octahydro-1,4a-dimethyl-		
15.		7-(1-methylethyl)-,		
16.		[1R-(1-α, 4aβ, 10aα)]		
17.				
18.				
19.				
20.				

* See notation in main body of report

Sample No.: 2916

Lab Standard ID:

U. S. ENVIRONMENTAL PROTECTION AGENCY
HWI SAMPLE MANAGEMENT OFFICE

Lab Name: Toxicon
Report No: 1

QUALITY CONTROL REPORT

A. MATRIX SPIKE ANALYSIS

COMPOUND (including surrogates)					CONCENTRATION (ug/l)			% Recovery*
P. P.		#		COMPOUND NAME	Sample Result (SR)	Spiked Sample Result (SSR)	Spike Added (SA)	
		4	V	benzene	0	26.7	25	107
	8	6	V	toluene	0	23.3	25	93
		7	V	chlorobenzene	0	21.0	25	84
				d_6-benzene *	99.4	104.9	100	
				d_8-toluene *	95.6	96.0		
				* Percent recovery has no significance in this context				

This QC Report also covers the following sample numbers: FØ317; FØ318; FØ319 - Volatiles

% Recovery = $\frac{(SSR - SR)}{(SA)}$ X 100

MAY 11 1981

Standard ID: [redacted]

...MS SAMPLE MANAGEMENT OFFICE

Report No: [redacted]

QUALITY CONTROL REPORT

A. MATRIX SPIKE ANALYSIS

...MPOUND (including surrogates)				CONCENTRATION (ug/l)			
P.	#		COMPOUND NAME	Sample Result (SR)	Spiked Sample Result (SSR)	Spike Added (SA)	% Recovery*

QC Report also covers the following sample numbers: _____

Recovery = $\frac{(SSR - SR)}{(SA)}$ X 100

MAY 1 1 1981

Notes:

(1) The following file reference numbers (FRN) correspond with the EPA sample numbers for Case 397:

(a) F0316 Bethel M. B. Church Well
VOA: 12722
B/N: 13310
Acid: 13206

(b) F0317 S.E. Corner Ditch at W.R.
VOA: 12723
B/N: 13402
Acid: 13208

(c) F0318 West Ditch, 200' S. of Corner
VOA: 12801
B/N: 13404
Acid: 13301

(d) F0319 1000' S. of Wallaceville Road
VOA: 12800
B/N: 13410
Acid: 13300

(2) Samples F0316, F0317, F0318 and F0319 have been corrected with their associated method blanks. For the volatiles, methylene chloride was always found to be present in the samples at a level less than that in the method blank; hence the term "Blank contaminant".

(3) In the volatile organics samples analyses, the first peak observed in each run is due to air introduced by the Tekmar LSC-II purge and trap sampler. A mass spectrum of one of the components, carbon dioxide, has been included with each run.

(4) The data for all DFTPP and p-BFB runs are included at the beginning of the report. The dates correspond to the particular sample sets run, i.e., 3/26/81 for the volatile organics analyses; 3/21/81, 3/24/81 and 3/25/81 for the base-neutral extracts; 4/8/81 for the acid extracts; and 5/7/81 for the pesticide extract F0318.

(5) The relative response ratios for the volatile organics, base-neutrals, and acids are included at the beginning of the report.

(6) For samples F0317, F0318, and F0319, the pesticide extracts were run on two columns, first the 3% OV-1 and secondly a SP-2250/SP-2401 for confirmation. Both sets of chromatographic runs are included. Sample F0316 was found to be free of pesticides, and therefore a confirmation run on the OV-1 column was not necessary. Due to the complex sample matrix of F0318 (comprised of what appears to be a mixture of chlorinated compounds), this sample was run on the 3% SP-2250 column.

(7) Only those non-priority pollutant peaks of intensity greater than 5% of that of the internal standard were library searched.

(8) An attempt was made to meet column performance specifications using 50 ng of pentachlorophenol for the 1% SP-1240 DA and 100 ng of a freshly prepared solution of benzidine for the 3% SP-2250. An extracted ion current profile for the pentachlorophenol, and the tailing factor calculation, have been included. Benzidine was not detected at the prescribed level.

(9) In the base-neutral fractions, d5-pyridine has not been detected using the normal programmed temperature run. In an attempt to find an explanation for this non-recovery, a temperature programmed run was begun at 30°. At this temperature (30°), the d5-pyridine was observed to elute at the trailing edge of the solvent peak. It would appear that in order to observe d5-pyridine, it will be necessary to begin the run at a lower temperature with the aid of cryogenic cooling. Any comments or suggestions would be appreciated.

(10) With the exception of the pesticide fractions, all results have been reported to 2 significant figures.

(11) It should be noted that a duplicate analysis has not been included for the volatile organics, and a spiked sample analysis has not been included for the base-neutral fractions. The former was run, but the data was lost due to a computer error. The base-neutral spiked sample vial was broken prior to analysis. However, the quality assurance/quality control standards established in the contract have still been met (i.e., one duplicate and one spiked sample per twenty samples run).

(12) A comment was made that the spectra which we have submitted have been poorly documented. Therefore, an attempt has been made to order the data in a logical fashion. Any priority pollutants found are included first (the extracted ion current profile, followed by the spectrum and the library search report). To facilitate identification, the priority pollutants have also been labelled. In the case of the unknowns, a spectrum is first included, and the library search follows. The scan number in the upper left hand corner of the spectrum should be identical to that appearing at the beginning of the library search report. An example has been included.

(13) It should be noted that in some cases a chromatographic peak was identified as being composed of a particular compound plus an unknown component. For complex sample matrices, such as that exemplified by sample F0318, it is apparent from the mass spectra that certain of the peaks are comprised of more than the component. However, in several cases, an effective separation could not be achieved.

(14) For the pesticide fraction, F0318, 4,4'-DDE, 4,4'-DDD and 4,4'-DDT appeared to be present at levels exceeding the detection limits by GC/MS. (This conclusion was reached by running the extract first on a 3% OV-1 column, and then on an SP-2250/SP-2401 column.) MAY 11 1981 Therefore, the extract was run by GC/MS using a SP-2250 column. Although peaks were found with the same retention times and ions as those characteristic of the three pesticides aforementioned, a comparison of the spectra of standard and "unknown" revealed the peaks to be compounds other than the pesticides. These comparison spectra are included in the body of the report.

It would appear that the pesticides 4,4'-DDT, 4,4'-DDE, and 4,4'-DDD reported in samples F0317 and F0319 may result either from contamination (introduced as described in the main body of the report for the method blank), or from the presence of compounds with similar retention times and fragmentation patterns as those of 4,4'-DDE, 4,4'-DDD, and 4,4'-DDT. Due to the low levels detected, confirmation by GC/MS could not be performed.

U.S. ENVIRONMENTAL PROTECTION AGENCY - HWI Sample Management Office
P.O. Box 818, Alexandria, VA 22313 - 703/683-0385

Sample Number
FO316 Ezekiel M.E Church Well
Case 597

ORGANICS ANALYSIS DATA SHEET

LABORATORY NAME Ionicon

LAB SAMPLE ID NO. 702/1

MAY 11 1981

QC REPORT NO. 4

	ACID COMPOUNDS	ug/l
21A	2,4,6- trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2- chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4- dimethylphenol	ND
57A	2- nitrophenol	ND
58A	4- nitrophenol	ND
59A	2,4- dinitrophenol	ND
60A	4,6- dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	ug/l
1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4- trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3'-dichlorobenzidine	ND
35B	2,4- dinitrotoluene	ND
36B	2,6- dinitrotoluene	ND
37B	1,2- diphenylhydrazine (as azobenzene)	ND
39B	fluoranthene	ND
40B	4- chlorophenyl phenyl ether	ND

	BASE/NEUTRAL COMPOUNDS	ug/l
41B	4-bromophenyl phenyl ether	ND
42B	bis (2-chloroisopropyl) ether	ND
43B	bis (2-chloroethoxy) methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	ND
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis (2-ethylhexyl) phthalate	*
67B	butyl benzyl phthalate	ND
68B	di-n-butyl phthalate	*
69B	di-n-octyl phthalate	ND
70B	diethyl phthalate	Blank contaminant
71B	dimethyl phthalate	Blank contaminant
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	indeno(1,2,3-cd)pyrene	ND
84B	pyrene	ND

Sample Number
F0316
Case 397

ORGANICS ANALYSIS DATA SHEET - Page 2

MAY 1 1 1988

LABORATORY NAME Ionics

LAB SAMPLE ID NO. 708/1

QC REPORT NO. 4

	VOLATILES	ug/l
2V	acrolein	ND
3V	acrylonitrile	ND
4V	benzene	ND
6V	carbon tetrachloride	ND
7V	chlorobenzene	ND
10V	1,2-dichloroethane	ND
11V	1,1,1-trichloroethane See notations	*
13V	1,1-dichloroethane	ND
14V	1,1,2-trichloroethane	ND
15V	1,1,2,2-tetrachloroethane	ND
16V	chloroethane	ND
19V	2-chloroethylvinyl ether	ND
23V	chloroform	ND
29V	1,1-dichloroethylene	ND
30V	1,2-trans-dichloroethylene	ND
32V	1,2-dichloropropane	ND
33V	1,3-dichloropropylene	ND
38V	ethylbenzene	ND
44V	methylene chloride Blank Contaminant	
45V	methyl chloride	ND
46V	methyl bromide	ND
47V	bromoform	ND
48V	dichlorobromomethane	ND
49V	trichlorofluoromethane	ND
50V	dichlorodifluoromethane	ND
51V	chlorodibromomethane	ND
85V	tetrachloroethylene	ND
86V	toluene Blank contaminant	
87V	trichloroethylene	ND
88V	vinyl chloride	ND

Note: Because the ions at m/e 117 and 119 were not visible in the mass spectrum, the presence of

	PESTICIDES	ug/l
89P	aldrin	ND
90P.	dieldrin	ND
91P	chlordane	ND
92P	4,4'-DDT	ND
93P	4,4'-DDE	ND
94P	4,4'-DDD	ND
95P	-endosulfan	ND
96P	-endosulfan	ND
97P	endosulfan sulfate	ND
98P	endrin	ND
99P	endrin aldehyde	ND
100P	heptachlor	ND
101P	heptachlor epoxide	ND
102P	-BHC	ND
103P	-BHC	ND
104P	-BHC	ND
105P	-BHC	ND
106P	PCB-1242	ND
107P	PCB-1254	ND
108P	PCB-1221	ND
109P	PCB-1232	ND
110P	PCB-1248	ND
111P	PCB-1260	ND
112P	PCB-1016	ND
113P	toxaphene	ND

	DIOXINS	
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

*Less than 10 ug/l (pesticides less than 0.1 ug/l)

ND - Not detected

Report No: 4

MAY 11 19[illegible]

FC316
Case 397

A. SURROGATE SPIKE RESULTS

COMPOUND	Fraction	Conc. (ug/l)	(Surrogates only) Spike Added (ug/l)	(Surrogates only) % Recovery
d_6- benzene	VO	99.4	100	99
d_8- toluene	VO	95.6	100	96
d_6- phenol	A	41.8	100	42
2- fluorophenol	A	56.6	100	57
2- fluorobiphenyl	B/N	56.4	100	56
d_5- pyridine	B/N	ND *	100	0
d_5- nitrobenzene	B/N	68.4	100	68
d_8- naphthalene	B/N	62.2	100	62

B. TENTATIVELY IDENTIFIED COMPOUNDS

	CAS #	COMPOUND NAME	Fraction	% Maximum Score Attained Mass Matching Routine: Probability Based Search (Incurvo) (specify)
1.	00005-41059	Hexamethylcyclotrisiloxane (column bleed)	VO	85.5
2.	00005-41059	Hexamethylcyclotrisiloxane (column bleed)	VO	85.5
3.	00000-84662	diethyl phthalate	A	98.2
4.		a trimethylsilane derivative **	A	96.4
5.		a trimethylsilane derivative **	A	
6.				
7.	00295-54263	bis (2-ethylhexyl) phthalate	A	85.2
8.	00559-56371	4,5-dimethyl-2-heptene-3-ol	B/N	97.5
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.		** Possibly due to septum bleed		
17.				
18.				
19.				
20.				

* See note in main body of report.

U.S. ENVIRONMENTAL PROTECTION AGENCY - CLP Sample Management Office
P.O. Box 818, Alexandria, VA 22313 - 703/683-0885

Sample Number
F0317 S.E. Cone
Ditch @ N.R.
Case 397

ORGANICS ANALYSIS DATA SHEET

LABORATORY NAME Lewicon

LAB SAMPLE ID NO. 708/2

QC REPORT NO. 4

MAY 11 1981

	ACID COMPOUNDS	ug/l
21A	2,4,6- trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2- chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4- dimethylphenol	ND
57A	2- nitrophenol	ND
58A	4- nitrophenol	ND
59A	2,4- dinitrophenol	ND
60A	4,6- dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	ug/l
1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4- trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3'-dichlorobenzidine	ND
35B	2,4- dinitrotoluene	ND
36B	2,6- dinitrotoluene	ND
37B	1,2- diphenylhydrazine (as azobenzene)	ND
39B	fluoranthene	ND
40B	4- chlorophenyl phenyl ether	ND

	BASE/NEUTRAL COMPOUNDS	ug/l
41B	4-bromophenyl phenyl ether	ND
42B	bis (2-chloroisopropyl) ether	ND
43B	bis (2-chloroethoxy) methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	ND
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis (2-ethylhexyl) phthalate	*
67B	butyl benzyl phthalate	ND
68B	di-n-butyl phthalate	*
69B	di-n-octyl phthalate	ND
70B	diethyl phthalate	Blank Contaminant
71B	dimethyl phthalate	*
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(gh:)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	indeno(1,2,3-cd)pyrene	ND
84B	pyrene	ND

Sample Number
F0317
Case 397

ORGANICS ANALYSIS DATA SHEET - Page 2

MAY 11 1991

LABORATORY NAME Ionicon

LAB SAMPLE ID NO. 708/2

QC REPORT NO. 4

	VOLATILES	ug/l
2V	acrolein	ND
3V	acrylonitrile	ND
4V	benzene	ND
6V	carbon tetrachloride	ND
7V	chlorobenzene	ND
10V	1,2-dichloroethane	ND
11V	1,1,1-trichloroethane	ND
13V	1,1-dichloroethane	ND
14V	1,1,2-trichloroethane	ND
15V	1,1,2,2-tetrachloroethane	ND
16V	chloroethane	ND
19V	2-chloroethylvinyl ether	ND
23V	chloroform	ND
29V	1,1-dichloroethylene	ND
30V	1,2-trans-dichloroethylene	ND
32V	1,2-dichloropropane	ND
33V	1,3-dichloropropylene	ND
38V	ethylbenzene	ND
44V	methylene chloride	Blank contaminant
45V	methyl chloride	ND
46V	methyl bromide	ND
47V	bromoform	ND
48V	dichlorobromomethane	ND
49V	trichlorofluoromethane	ND
50V	dichlorodifluoromethane	ND
51V	chlorodibromomethane	ND
85V	tetrachloroethylene	ND
86V	toluene	Blank contaminant
87V	trichloroethylene	ND
88V	vinyl chloride	ND

	PESTICIDES		ug/
89P	aldrin		ND
90P.	dieldrin		ND
91P	chlordane		ND
92P	4,4'-DDT	see note 14	** 1.18
93P	4,4'-DDE	see note 14	** 0.82
94P	4,4'-DDD	see note 14	** 2.25
95P	-endosulfan		ND
96P	-endosulfan		ND
97P	endosulfan sulfate		ND
98P	endrin		ND
99P	endrin aldehyde		ND
100P	heptachlor		ND
101P	heptachlor epoxide		ND
102P	-BHC		ND
103P	-BHC		ND
104P	-BHC		ND
105P	-BHC		ND
106P	PCB-1242		ND
107P	PCB-1254		ND
108P	PCB-1221		ND
109P	PCB-1232		ND
110P	PCB-1248		ND
111P	PCB-1260		ND
112P	PCB-1016		ND
113P	toxaphene		ND

DIOXINS

129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

*Less than 10 ug/l
(pesticides less than 0.1 ug/l)

Report No: 4

Sample Number: F0317

A. SURROGATE SPIKE RESULTS

COMPOUND	Fraction	Conc. (ug/l)	(Surrogates only) Spike Added (ug/l)	(Surrogates only) % Recovery
d_6- benzene	VO	96.2	100	96
d_8- toluene	VO	94.2	100	96
d_6- phenol	A	33.9	100	34
2- fluorophenol	A	45.8	100	46
2- fluorobiphenyl	B/N	46.1	100	46
d_5- pyridine	B/N	ND *	100	0
d_5- nitrobenzene	B/N	56.7	100	57
d_8- naphthalene	B/N	49.7	100	50

B. TENTATIVELY IDENTIFIED COMPOUNDS

	CAS #	COMPOUND NAME	Fraction	% Maximum Score Attained Mass Matching Routine: Probability Based Search (Finnigan) (specify)
1.	00005-56672	Octamethylcyclotetrasiloxane	VO	98.3
2.	00005-41059	Hexamethylcyclotrisiloxane	VO	95.5
3.	00000-84662	diethyl phthalate	A	98.2
4.	00275-54263	bis (2-ethylhexyl) phthalate	A	84.7
5.	00559-56871	4,5-dimethyl-2-hepten-3-ol	B/N	97.4
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

* See notation on narrative body of report

U.S. ENVIRONMENTAL PROTECTION AGENCY - HWI Sample Management Office
P.O. Box 818, Alexandria, VA 22313 - 703/683-0885

Sample Number
F0318 W. Ditch
200' S. of N.E. Corn
Case 397

ORGANICS ANALYSIS DATA SHEET

LABORATORY NAME Lancon

LAB SAMPLE ID NO. 708/3

MAY 11 1991

QC REPORT NO. 4

	ACID COMPOUNDS	ug/l
21A	2,4,6- trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2- chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4- dimethylphenol	82
57A	2- nitrophenol	ND
58A	4- nitrophenol	ND
59A	2,4- dinitrophenol	ND
60A	4,6- dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	ug/l
1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4- trichlorobenzene	*
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	*
27B	1,4-dichlorobenzene	ND
28B	3,3'-dichlorobenzidine	ND
35B	2,4- dinitrotoluene	ND
36B	2,6- dinitrotoluene	ND
37B	1,2- diphenylhydrazine (as azobenzene)	ND
39B	fluoranthene	ND
40B	4- chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis (2-chloroisopropyl) ether	ND
43B	bis (2-chloroethoxy) methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	*
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis (2-ethylhexyl) phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butyl phthalate	ND
69B	di-n-octyl phthalate	ND
70B	diethyl phthalate	*
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	indeno(1,2,3-cd)pyrene	ND
84B	pyrene	ND

ORGANICS ANALYSIS DATA SHEET - Page 2

LABORATORY NAME Lexicon

LAB SAMPLE ID NO. 702/3

QC REPORT NO. 4

MAY 11 1991

	VOLATILES	ug/l
2V	acrolein	ND
3V	acrylonitrile	ND
4V	benzene	*
6V	carbon tetrachloride	ND
7V	chlorobenzene	19
10V	1,2-dichloroethane	ND
11V	1,1,1-trichloroethane	ND
13V	1,1-dichloroethane	ND
14V	1,1,2-trichloroethane	ND
15V	1,1,2,2-tetrachloroethane	*
16V	chloroethane	ND
19V	2-chloroethylvinyl ether	ND
23V	chloroform	26
29V	1,1-dichloroethylene	ND
30V	1,2-trans-dichloroethylene	ND
32V	1,2-dichloropropane	ND
33V	1,3-dichloropropylene	ND
38V	ethylbenzene	700
44V	methylene chloride	*
45V	methyl chloride	ND
46V	methyl bromide	ND
47V	bromoform	ND
48V	dichlorobromomethane	ND
49V	trichlorofluoromethane	ND
50V	dichlorodifluoromethane	ND
51V	chlorodibromomethane	ND
85V	tetrachloroethylene (See notation)	*
86V	toluene	92
87V	trichloroethylene	ND
88V	vinyl chloride	ND

Note: Although the retention time of the peak designated as tetrachloroethylene is identical to that of the standard, a definitive spectrum could not be obtained.

	PESTICIDES	u
89P	aldrin	ND
90P.	dieldrin	ND
91P	chlordane	ND
92P	4,4'-DDT (See note 14)	ND
93P	4,4'-DDE (See note 14)	ND
94P	4,4'-DDD (See note 14)	ND
95P	-endosulfan	ND
96P	-endosulfan	ND
97P	endosulfan sulfate	ND
98P	endrin	ND
99P	endrin aldehyde	ND
100P	heptachlor	ND
101P	heptachlor epoxide	ND
102P	-BHC	ND
103P	-BHC	ND
104P	-BHC	ND
105P	-BHC	ND
106P	PCB-1242	ND
107P	PCB-1254	ND
108P	PCB-1221	ND
109P	PCB-1232	ND
110P	PCB-1248	ND
111P	PCB-1260	ND
112P	PCB-1016	ND
113P	toxaphene	ND

	DIOXINS	
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

*Less than 10 ug/l (pesticides less than 0.1 ug/l)

ND - Not detected

Fraction No: 4

Sample Number
F0318
Case 3397

DAY 1 (1990)

A. SURROGATE SPIKE RESULTS

COMPOUND	Fraction	Conc. (ug/l)	(Surrogates only) Spike Added (ug/l)	(Surrogates only) % Recovery
d_6- benzene	VO	97.0	100	97
d_8- toluene	VO	96.2	100	96
2- fluorophenol	A	68.6	100	69
d_6- phenol	A	46.7	100	47
2- fluorobiphenyl	B/N	50.1	100	50
d_5- pyridine	B/N	ND *	100	0
d_5- nitrobenzene	B/N	65.2	100	65
d_8- naphthalene	B/N	46.1	100	46
* See notation in main body of report				

B. TENTATIVELY IDENTIFIED COMPOUNDS

	CAS #	COMPOUND NAME	Fraction	% Maximum Score Attained Mass Matching Routine: Probability Based Search (Forward) (specify)
1.	00000-67641	2-propanone + unknown co-eluting compound	VO	98.8
2.	00000-78933	2-Butanone	VO	97.3
3.	00006-24920	dimethyl disulfide	VO	98.1
4.	00006-11143	1-ethyl-2-methylbenzene	VO	98.1
5.	00001-08383	(1,4) 1,3-dimethylbenzene	VO	98.1
6.	00000-95476	1,2-dimethylbenzene	VO	98.1
7.	00001-03651	propylbenzene	VO	98.0
8.	00000-98862	1-phenylethanone	A	98.1
9.	00001-03720	, Isothiocyanatobenzene	A	98.0
10.	00000-89952	2-methylbenzenemethanol	A	98.1 **
11.	00000-84662	diethyl phthalate	A	98.2
12.	00000-99047	3-methylbenzoic acid	A	98.1
13.	00000-58899	1,2,3,4,5,6-hexachlorocyclohexane	A	98.2
14.	00001-04443	2,5-cyclohexadiene-1,4-dione, compd. with 1,4-benzenediol	A	98.1
15.	00275-54263	bis(2-ethylhexyl) phthalate	A	85.4
16.	00026-42800	1,1'-(2-chloroethylidene) bis[4-chloro benzene]	A	93.0
17.	00000-95476	1,2-dimethylbenzene	B/N	98.1
18.	00006-20144	1-ethyl-3-methylbenzene	B/N	98.1
19.	00005-26733	1,2,3-trimethylbenzene	B/N	98.1
20.	00000-93551	α-methylbenzenemethanol	B/N	98.1

** Multiplier (index) low due to presence of background ions which could not be compensated for.

Inc: Ionic 2

Report No: 4

MAY 1 1 15 | Sample Number 1-3318 Case 397

A. SURROGATE SPIKE RESULTS

COMPOUND	Fraction	Conc. (ug/l)	(Surrogates only) Spike Added (ug/l)	(Surrogates only) % Recovery

(continued) B. TENTATIVELY IDENTIFIED COMPOUNDS

	CAS #	COMPOUND NAME	Fraction	% Maximum Score Attained Mass Matching Routine: Probability Based Search (Manual) (specify)
21.		1-phenylethanone	B/N	no good library search match -
22.	00000-89952	2-methylbenzenemethanol	B/N	98.1
23.	00003-15846	1,2,3,4,5,6-hexachlorocyclohexane	B/N	98.3
24.	00000-50293	1,1'-(2,2,2-trichloroethylidene) bis [4-chlorobenzene]	B/N	98.3
25.	00000-99047	3-methyl-benzoic acid	A	97.7
26.		+ unknown (possibly		
27.		chlorinated compound)		
28.	—	Unknown at scan # 345	A	—
29.		(no good library matches)		
30.				
31.				
32.				
33.				
34.				
35.				
36.				
37.				
38.				
39.				

U.S. ENVIRONMENTAL PROTECTION AGENCY - HWI Sample Management Office
P.O. Box 818, Alexandria, VA 22313 - 703/683-0885

Sample Number
F03I9 1000' S. of Wallaceville Rd
Case 397

ORGANICS ANALYSIS DATA SHEET

LABORATORY NAME Lovicon

LAB SAMPLE ID NO. 708/4

MAY 11 1981

QC REPORT NO. 4

	ACID COMPOUNDS	ug/l
21A	2,4,6- trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2- chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4- dimethylphenol	ND
57A	2- nitrophenol	ND
58A	4- nitrophenol	ND
59A	2,4- dinitrophenol	ND
60A	4,6- dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	ug/l
1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4- trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3'-dichlorobenzidine	ND
35B	2,4- dinitrotoluene	ND
36B	2,6- dinitrotoluene	ND
37B	1,2- diphenylhydrazine (as azobenzene)	ND
39B	fluoranthene	ND
40B	4- chlorophenyl phenyl ether	ND

	BASE/NEUTRAL COMPOUNDS	ug/l
41B	4-bromophenyl phenyl ether	ND
42B	bis (2-chloroisopropyl) ether	ND
43B	bis (2-chloroethoxy) methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	ND
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis (2-ethylhexyl) phthalate	*
67B	butyl benzyl phthalate	ND
68B	di-n-butyl phthalate	*
69B	di-n-octyl phthalate	ND
70B	diethyl phthalate	*
71B	dimethyl phthalate	*
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	indeno(1,2,3-cd)pyrene	ND
84B	pyrene	ND

Sample Number
FQ319
Case 397

ORGANICS ANALYSIS DATA SHEET - Page 2

LABORATORY NAME Ionicom

LAB SAMPLE ID NO. 708/4

QC REPORT NO. 4

MAY 1 1 1987

	VOLATILES	ug/l
2V	acrolein	ND
3V	acrylonitrile	ND
4V	benzene	ND
6V	carbon tetrachloride	ND
7V	chlorobenzene	ND
10V	1,2-dichloroethane	ND
11V	1,1,1-trichloroethane	ND
13V	1,1-dichloroethane	ND
14V	1,1,2-trichloroethane	ND
15V	1,1,2,2-tetrachloroethane	ND
16V	chloroethane	ND
19V	2-chloroethylvinyl ether	ND
23V	chloroform	*
29V	1,1-dichloroethylene	ND
30V	1,2-trans-dichloroethylene	ND
32V	1,2-dichloropropane	ND
33V	1,3-dichloropropylene	ND
38V	ethylbenzene	ND
44V	methylene chloride	*
45V	methyl chloride	ND
46V	methyl bromide	ND
47V	bromoform	ND
48V	dichlorobromomethane	ND
49V	trichlorofluoromethane	ND
50V	dichlorodifluoromethane	ND
51V	chlorodibromomethane	ND
85V	tetrachloroethylene	ND
86V	toluene (Blank Contaminant)	
87V	trichloroethylene	ND
88V	vinyl chloride	ND

	PESTICIDES	ug/l
89P	aldrin	ND
90P.	dieldrin	ND
91P	chlordane	ND
92P	4,4'-DDT (see note 14)	** 0.22
93P	4,4'-DDE (see note 14)	** 0.12
94P	4,4'-DDD (see note 14)	** 0.57
95P	-endosulfan	ND
96P	-endosulfan	ND
97P	endosulfan sulfate	ND
98P	endrin	ND
99P	endrin aldehyde	ND
100P	heptachlor	ND
101P	heptachlor epoxide	ND
102P	-BHC	ND
103P	-BHC	ND
104P	-BHC	ND
105P	-BHC	ND
106P	PCB-1242	ND
107P	PCB-1254	ND
108P	PCB-1221	ND
109P	PCB-1232	ND
110P	PCB-1248	ND
111P	PCB-1260	ND
112P	PCB-1016	ND
113P	toxaphene	ND

DIOXINS

129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

*Less than 10 ug/l
(pesticides less than 0.1 ug/l)

Standard ID: ____________

U. S. ENVIRONMENTAL PROTECTION AGENCY
HWI SAMPLE MANAGEMENT OFFICE

[redacted]

Lab Name: Jevicom
Report No: ____________
Page 4 of 5

QUALITY CONTROL REPORT

A. MATRIX SPIKE ANALYSIS

COMPOUND (including surrogates)				CONCENTRATION (ug/l)			% Recovery*
P.	P.	#	COMPOUND NAME	Sample Result (SR)	Spiked Sample Result (SSR)	Spike Added (SA)	
2	4	A	2-chlorophenol	0	27.2	50	54
6	5	A	phenol	0	23.8	50	48
2	2	A	p-chloro-m-cresol	0	73.2	50	146
6	4	A	pentachlorophenol	0	34.2	50	68
5	8	A	4-nitrophenol	0	14.6	50	29
			d_6-phenol	33.9	37.1	100	
			2-fluorophenol	43.8	35.0	100	

* Percent recovery has no significance in this context

This QC Report also covers the following sample numbers: FØ316; FØ318; FØ319 - Acids and Pesticides

% Recovery = $\frac{(SSR - SR)}{(SA)}$ X 100

[redacted] U.S. ENVIRONMENTAL PROTECTION AGENCY
HWI SAMPLE MANAGEMENT OFFICE

Standard ID: _____

Lab Name: Lancaster
Report No: _____
Page 4 of 5

QUALITY CONTROL REPORT

A. MATRIX SPIKE ANALYSIS

COMPOUND (including surrogates)				CONCENTRATION (ug/l)			
P. P. #			COMPOUND NAME	Sample Result (SR)	Spiked Sample Result (SSR)	Spike Added (SA)	% Recovery*
8	9	P	Aldrin	0	5.31	5.00	106
0	0	P	Heptachlor	0	4.52	5.00	90
9	0	P	Dieldrin	0	1.94	5.00	39

This QC Report also covers the following sample numbers: F0316; F0317; F0318 - Pesticides

* Recovery = $\frac{(SSR - SR)}{(SA)} \times 100$

Lab Standard ID: ______________

HWI SAMPLE MANAGEMENT OFFICE

[redacted] [illegible]
Report No: ______________

QUALITY CONTROL REPORT

B. DUPLICATE ANALYSIS

COMPOUND (including surrogates)				CONCENTRATION (ug/l)		Relative Percent Difference (RPD)*
P. P. #			COMPOUND NAME	Aliquot 1 (D_1)	Aliquot 2 (D_2)	
			2-fluorophenol (Acid surrogate)	56.6	50.7	11
			d6-phenol (Acid surrogate)	41.8	33.5	22
7	1	B	dimethyl phthalate (not corrected by blank)	3.8	5.9	43
7	0	B	diethyl phthalate (not corrected by method blank)	1.6	1.5	6
6	8	B	di-n-butyl phthalate (not corrected by method blank)	1.3	0.6	74
6	6	B	bis (2-ethylhexyl) phthalate (not corrected by blank)	2.4	2.0	18
			2-fluorobiphenyl (B/N surrogate)	56.4	52.5	7
			d5-pyridine (B/N surrogate)	0	0	0
			d5-nitrobenzene (B/N surrogate)	68.4	69.5	2
			d8-naphthalene (B/N surrogate)	62.2	54.9	12

This QC Report also covers the following sample numbers: FØ317; FØ318; FØ319 - Acids and Base-Neutrals

$$*RPD = \frac{(D_1 - D_2)}{[(D_1 + D_2)/2]} \times 100$$

MAY [illegible]

QUALITY CONTROL REPORT

B. DUPLICATE ANALYSIS

COMPOUND (including surrogates)				CONCENTRATION (ug/l)		Relative Percent Difference (RPD)*
P. P. #			COMPOUND NAME	Aliquot 1 (D_1)	Aliquot 2 (D_2)	
9	2	P	4,4'- DDT	1.18	0.91	26
9	3	P	4,4'- DDE	0.82	0.80	2
9	4	P	4,4'- DDD	2.05	2.14	5

This QC Report also covers the following sample numbers: FØ316; FØ318; FØ319 – Pesticides

$$*RPD = \frac{(D_1 - D_2)}{[(D_1 + D_2)/2]} \times 100$$

MAY 11 1981

ATTACHMENT D/8

DESCRIPTION OF SAMPLING LOCATIONS AT THE OLD OLIN SITE, HOUSTON, TX

Sample Locations		Disposition		Approx. Depth	Description
1	#3649	Analyze	✓	Surface	Med. brown, grain size ranged from upper medium (1.0 Ø) to upper very coarse (-1.0 Ø), high organic odor w/ pesticide; some yellow and white granules present which are not indigenous to soil; sand grains appeared rounded. (see photos # 43, #44 and #46)
	#3650	Analyze	✓	24"	dk. bn. to bk. silty clay: organic odor; iron nodules approx. 0.0 Ø to 1.5 Ø in size, w/ deep orange red hematitic staining around them.
	#3651	Hold	✓	48"	dk. bn. to bk. silty clay - not a pure clay - but a greater percentage of clay w/ depth. Similar iron nodules as at 18" sample. Soil had a natural organic odor.
2	#3652	Hold	✓	Surface	bk., silty sand - no noticable odors. (see photos #37 thru #41)
	#3653	Analyze	✓	24"	bk. to dk. bn. clay - very viscous; plastic.
	#3654	Hold	✓	48"	bk. gray bn. clay - very viscous; plastic
3	#3655	Analyze	✓	Surface	(see photos #1 thru #6)
	#3656	Hold	✓	24"	dk. gray to dk. bn. silty clay.
	#3657	Hold	✓	48"	dk. gray to dk. bn. clay.
4	#3658	Hold	✓	Surface	Similar to sample location #1. (see photos #49 thru #52)
	#3659	Analyze	✓	24"	
	#3660	Hold	✓	48"	
✓ 5	#3661	Hold	✓	Surface	Med. to dk. bn., sandy, silt (0.5 Ø to 2.0 Ø) yellow granules of sulfur, approx.10% of soil. Heavily contaminated w/ pesticide odor and organics. (see photos #14, ~~and~~ #15)
	#3662	Analyze	✓	24"	dk. bn. to dk. gray clay - some pesticide odor.
✓ 6	#3663	Analyze	✓	6"	bn. to gray, sandy silt, w/heavy odor from pesticides. Clay content increased w/depth.

Sample Locations	Disposition	Approx. Depth	Description
#3664	Hold	36"24	dk. bn. to bk. clay, very dense clay, impenetrable w/auger.
7 #3665	Hold	Surface	Similar to #6. Still had a heavy pesticide odor w/yellow (sulfur) granules present. (see photos #18 ~~thru #21~~)
#3667	Analyze	3" - 5"	~~1/4"~~ layer of yellow granules at approx. 3" depth.
#3666	Hold	24"	
8 #3668	Analyze	Surface	Highly organic silt, sand and clay. dk. bn. w/an organic odor.
#3669	Hold	24"	dk. bn. to bk. clay.
9 #3670	Analyze	Surface	High organic sandy clay.
10. #3671	Hold	6"	Heavy, fine grained silty clay, gray to dk. bn., bk. (see photos #8 and #28)
#3672	Analyze	12"	Same as 6", very difficult to remove from trowels, sticky, very viscous. No indication of any unusual odor or contamination.
12 #3673	Hold	Surface	bn. silty clay, some organic debris. (see photo #13)
#3674	Hold	12"	dk. bn. to med. gray clay. No indication of unusual odor or contamination.
13 #3675	Analyze	6"	dk. bn. sandy silt - no noticable pesticide odor. (see photos ~~#16 and~~ #17)
14 #3676	Hold	Surface	Med. to light bn. sandy silt.
#3677	Hold	6"	
15 #3678 (?)	Analyze	Sediment	bk. oily silt. Heavy organics; nocuous odor. (see photo #9)
15Alt. #3680	Hold	Sediment	(see photos #29 thru #34 and #36)

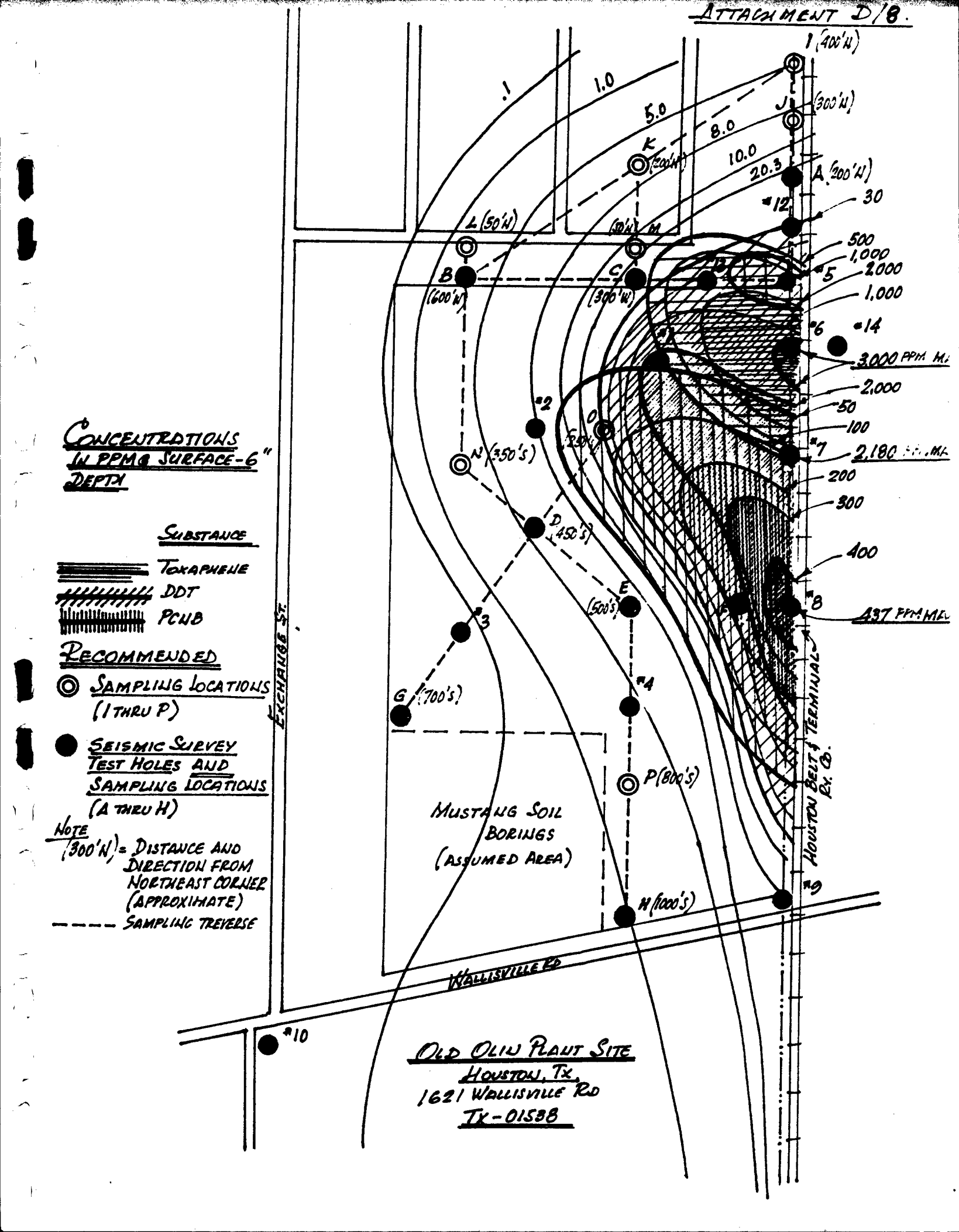
#3679

All soil samples to be analyzed were designated priority "B".

Water Samples:

7	✓	Analyze	Soil Water
9	✓	Analyze	Surface Water
11 ~~10~~	✓	Analyze	Well Water
15	✓	Analyze	Surface Water
15Alt.	✓	Hold	Surface Water.

ATTACHMENT D/8.



ATTACHMENT E

RECOMMENDATIONS

As a result of the tasks performed under TDD #F-6-8112-22 the following actions are recommended:

1. Site representatives be required to reconsider and supplement their Remedial Action Plan along the lines of the specific comments presented in Appendix A, and/or any other requirements or modification deemed necessary by EPA.

2. Site representatives be advised along the lines of the understandings reached at the Janaury 13, 1982, meeting and presented at the end of Appendix B and any other consideration or modification deemed necessary by EPA. Site representatives should also be advised of all sample analyses data.

3. Subsurface exploration plan be developed and executed according to the conclusions presented in Appendix C, and any other modification deemed necessary by EPA, and considered proposal(s) by site representatives, if any.

4. Sampling plan be developed and executed in conjunction with subsurface exploration in accordance with the tentative sampling plan presented in Appendix D/9 and/or any other plan or modification deemed necessary by EPA.

5. Establishment of monitoring well system be projected, but decision postponed until after the execution of subsurface exploration and sampling plan.

REFERENCE 14

Observations and Comments Regarding SP Oliver Yard (former Olin Site, Houston, Texas TX01538, from Dennis Guild, Environmental Engineer, Enforcement Section, to Samuel L. Nott, Chief, Enforcement Section, 22 April 1982.

(14)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: APR 22 1982

SUBJECT: SP Oliver Yard (former Olin Site), Houston, Texas TX01538

FROM: Dennis Guild, Environmental Engineer
Enforcement Section

TO: Samuel L. Nott, Chief
Enforcement Section

On Thursday, March 18, while returning to Dallas from my trip to Mission, I stopped in Houston and toured the SP Oliver Yard (former Olin Site) at 7621 Wallisville Road. I first toured the perimeter of the site with Mr. Clarence Johnson of the TDWR Deerpark office, and then we obtained permission from Mr. Dick Powell, a manager of Mustang Equipment, to tour the Mustang property. My observations and comments on the site are as follows:

I. Physical Conditions

1. The eastern sector of the site (owned by the Southern Pacific Railroad Company) is completely vacant. It has been covered by a layer of asphalt-like material.

2. The northwestern sector of the site (owner by Mustang Tractor and Equipment Company and leased to Seatrain Pacific Services, Inc.) is covered with a layer of crushed stone and shell which appears to be roughly 18 inches thick, and is currently being used to store truck trailers.

3. The southwestern sector of the site (now owned and occupied by Mustang Tractor and Equipment Company) is mostly covered by either buildings or asphalt. One area of this property (approximately 200' x 200') is still uncovered (i.e., it is just dirt and vegetation).

II. Contaminated and Uncontaminated Areas

1. According to recent sampling, the most contaminated area of the site is the north - south ditch along its eastern edge. Pesticide levels there range up to 41,508 ppm.

2. A drainage area along the northeastern side of the site (running in an east-west direction) is also heavily contaminated, one sample showing a pesticide concentration of 1490 ppm.

3. The area of the drainage ditch upstream of the site and upstream of the ditch mentioned in 2.II.1 above is also somewhat contaminated, one sample showing a pesticide concentration of 73 ppm.

4. The on-site area with the largest detected pesticide level is the northern sector of the Southern Pacific section of the site. A surface sample here showed pesticide of 2030 ppm. Samples acquired at 24" and 48" depth from the same location however, indicated pesticides of less than 1.0 ppm.

5. The surface of the Seatrain lot (northwestern area of site) is also somewhat contaminated, one surface sample showing a pesticide level of 37.4 ppm. Samples at 24" and 48" from the same location, however, showed pesticides of less than 1.0 ppm.

6. Samples from depths of 24" and 48", and at the surface were collected from the open area of the Mustang-owned and occupied property, but they all showed pesticides of less than 1.0 ppm.

7. One location from a drainage ditch in the center of the site was sampled, the surface showing 15.0 ppm, and the 24" and 48" depths each showing less than 1.0 ppm.

III. Issues

1. Olin Chemical has submitted a draft Remedial Action Plan to EPA, and it provides, among other things, for removal of contaminated materials from the north-south drainage ditch at the east side of the plant, and replacement with clean compacted clay. Their proposal calls for removal of 2.5 feet in depth along 600 feet of the most contaminated portion of the ditch, and removal of 1.5 feet in depth along the remaining 500 feet of the ditch. The distance dimensions of their proposal (along the length of the ditch), seem adequate, but the proposed depth of removal will doubtlessly leave some contaminated materials behind in certain places (see Figure 1). In the most contaminated area, for example, a sample at 24" revealed at pesticide level of 41,508 ppm, and only 30" are proposed to be removed there.

Options:

a. Assume Olin's proposal is adequate (i.e, that the 2.5 foot cover that they have proposed will adequately prevent movement of contaminated materials), and allow them to carry out their plan as they have already described it.

b. As regards item a. above, we have no convincing information which shows that migration of contamianted materials will not occur, or that only insignificant amounts of further contamination will remain. We might therefore require Olin and the other responsible parties to do further sampling to establish the degree of subsurface water movement in this area, and/or to establish the extent of contamination beyond what is already know to exist in this area.

c. A middle-of-the-road approach is to allow Olin to carry out their plan as proposed, with one additional item: that in the most contaminated area, they also remove and replace any visibly contaminated materials. This option would require Olin to remove the bulk of remaining contamination without giving them the burden and expense of additional sampling and analysis.

2. One of EPA's samples indicates contamination in the drainage ditch upgradient of the area mentioned in III.1. above. During an on-site meeting between the FIT and site representatives on Janaury 13, 1982, a consensus was reached among the parties that additional sampling is needed in the upgradient ditch. A consensus was also reached on the need for further sampling along the east - west drainage area at the north edge of the property and along a drainage ditch through the center of the site. The number and locations of samples is an issue that can be resolved by the technical staff of EPA and Ecology and Environment, but the following two issues need decisions from EPA Management:

a. Who should acquire and analyze the additonal samples? The cooperative spirit among the responsible parties is at best quite fragile, and they feel that sampling and analysis by EPA, rather than by them, would avoid strain on their fragile relationship. They therefore want EPA to obtain and analyze these samples.

b. How clean is clean? What pesticide level will be the cutoff according to which a decision to clean or not to clean an area will be made? It is possible, however, that the sampling will reveal that certain areas are obviously contaminated and certain areas are not. If this turns out to be the case, then we will not have to a squable over a particular clean-up level; we will just clean up the contaminated areas. It will probably therefore be best to delay any decisions on how clean is clean until after the additional samples are analyzed.

3. One of the EPA samples shows that the surface of the Southern Pacific sector of the site is heavily contaminated with pesticides (2030 ppm). The 24" and 48" depths at this same location are relatively uncontaminated (less than 1.0 ppm pesticides). It therefore appears that the surface of this area is contaminated, and that the subsurface is not. This degree of surface contamination is unacceptable, however. As a rough but not entirely analagous comparison, we are cleaning a residential area at another pesticide site in Texas (the Mission site) down to 8-10 ppm.

Since the SP Oliver Yard is not a residential area, we do not necessarily have to clean-up to 8-10 ppm, but we still ought to do a lot better than 2030 ppm. It is therefore recommended that further surface sampling be conducted to determine the extent of contamination here. Remedial options will include removal or covering, depending on the results of the sampling.

Problems associated with this area of the site are:

a. Will EPA or the responsible parties do this sampling?

b. This area of the site it has already been covered with an asphalt-like material. It is unfortunate that the cover itself seems to have been contaminated.

c. Once the additional sampling is completed, we will have to determine how clean is clean.

4. The Seatrain section of the site, the northwest corner, had pesticide levels of 37 ppm in a surface sample, and pesticide levels of less than 1.0 ppm at 24" and 48" depths at the same location. As with #3 above, it appears that, at least at the sampled location, the surface is somewhat contaminated, while the subsurface is not. This is again somewhat unfortunate because the surface has already been covered; it appears that the cover itself has been contaminated. The degree of contamination here, however, is not particularly high; it is borderline between needing some sort of remedial work and not needing it. Further, compounding the problems with this area are:

a. The cover in this area, a layer of crushed stone and shell, results in extremely dusty conditions (writer's observation of 3/18/82). The inclines the writer to feel that remedial work--asphalting, pyehaps -- might be appropriate.

b. This area is parking lot for truck trailers, some of which are stacked three trailers high. Perhaps as much as 30-50% of this area is covered by truck trailers stacked on top of each other, making any remedial efforts quite difficult.

Given the above conditions, is a clean-up warranted? Should we obtain the opinion of a professional toxicologist?

5. As mentioned earlier, the Mustang section of the site (the southwest sector), is largely covered by either buildings or asphalt, except for one segment of open ground. Since even this open ground was essentially uncontaminated (pesticide concentrations were less than 1.0 ppm) no action is deemed necessary for this sector of the site.

6. The final problem area at this site involves waste disposed in several underground locations. Aerial photogrpahy indicates that wastes have been deposited in pits or ponds beneath the current Seatrain section of the site. Olin has also indicated the existence of a former pit in the now uncovered area of the Mustang sector of the site. The existence of this pit is not confirmed by aerial photography, and samples in this general vicinity have indicated essentially no contamination at the surface or either the 24" or 48" depths. Further investigation is needed to confirm the existence or nonexistence of this former pit. It is possible that Olin mislocated this pit on the sketch they submitted, and that it might actually be one of the pits shown by aerial photograph to be in the Seatrain sector of the site.

It is not now known if any leaching of materials is occuring from the former pits on the Seatrain property. The subsurface stratigraphy in this area is not now clearly defined, but is thought to be primarily clay with some sand stringers which could permit relatively easy migration of contaminated materials. Aside from the subsurface stratigraphy, it appears that solvents, particularly xylene, have been deposited in this pits along with the pesticide materials. These solvents would strongly enhance the mobility of the pesticide materials.

Although we have no conclusive evidence that leaching is occuring from the former pit on the current Southern Pacific property, one of the areas in the north-south ditch on the east side of the Southern Pacific property shows pesticide peaks in the same general vicinity as a former pit. It is therefore likely that leaching is occuring from this pit.

Olin is aware of at least the pits on the Seatrain sector of the site, but they have no indicated an awareness of the pit on the Southern Pacific sector.

In past communications from Olin, they have indicated an opinion that "the character of surface and immediate subsurface soils and the solubility of the contaminants are such that significant migration of contaminants with the groundwater will not occur." They have therefore felt that it is unncessary to do any remedial work to address the possibility of contaminated materials.

Given the possible existence of sandy and permeable materials in the subsurface, the alleged existence of solvents in the disposal pits, and a highly possible existence of a current leaching condition (at the eastern edge of the Southern Pacific property), the unlikelihood of subsurface migration seems to be not nearly as certain as Olin suggests. Because of the above circumstances, it appears that some form of additional investigative and/or remedial action is essential.

Options:

a. Ecology and Enviroment has recommend that a seismic survey be completed. According to E & E, this type of survey will give information on such things as type, porosity, and water content of subsurface materials, possibily the depths of such materials, and locations of potential water-bearing sand lenses. This method, however, will apparently not tell us if migration of contaminated materials has occured, but rather just a rough likelihood that it might occur. And given that solvents are said to be among the buried materials, this method could underestimate the likelihood of migration.

b. Monitoring wells could be required. This is probably the most definitive, if not the only definitive, method for ascertaining the existence of subsurface migration of contaminated materials.

Even if a seismic study as mentioned above is carried out, we can not be sure of the existence or nonexistence of subsurface migration without monitoring wells. The RCRA Regs, for example, require monitoring wells at hazardous waste sites, not seismic surveys.

c. A seismic survey might, however, indicate a very low likelihood of migration. This low likelihood, together with the primarily industrial nature of the surrounding area, could yield an adequate justification for not requiring groundwater monitoring.

d. Another approach that would avoid the need for groundwater monitoring is to define the location and extent of the former pits, and to remove their contents and dispose of them in an approved landfill. Given the potentially large costs for the necessary investigative and removal work, however, Olin has not yet been receptive to this idea.

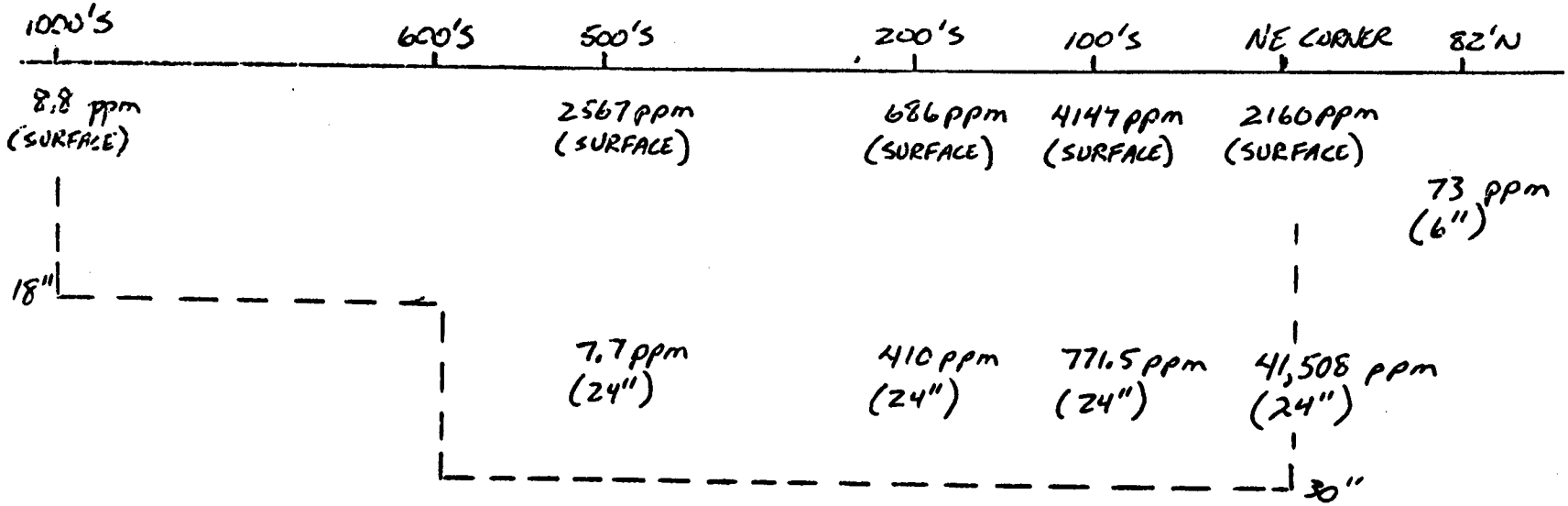
e. At an absolute minimum, we should ascertain whether or not the former pit on the eastern side of the Southern Pacific property is a source of migrating contaminants. Olin should be given the responsibility for making this determination.

Recommendation:

Request that Olin conduct the seismic survey, and inform them that depending upon the results of the monitoring, wells might or might not be required. Also inform them that we have not yet ruled out the need for remedial work (removal of contaminated materials, for example), and that the results of such a survey could establish the need for or nonnecessity of remedial work at this time. Finally, have Olin carry out item e. above.

FIGURE 1.

CROSS SECTION OF DITCH ON EAST SIDE OF S.P. OLIVER YARD



CONCENTRATIONS ARE TOTAL PESTICIDE CONCENTRATIONS IN PARTS PER MILLION

DASHED LINES INDICATE REMOVAL PROPOSED BY OLIN

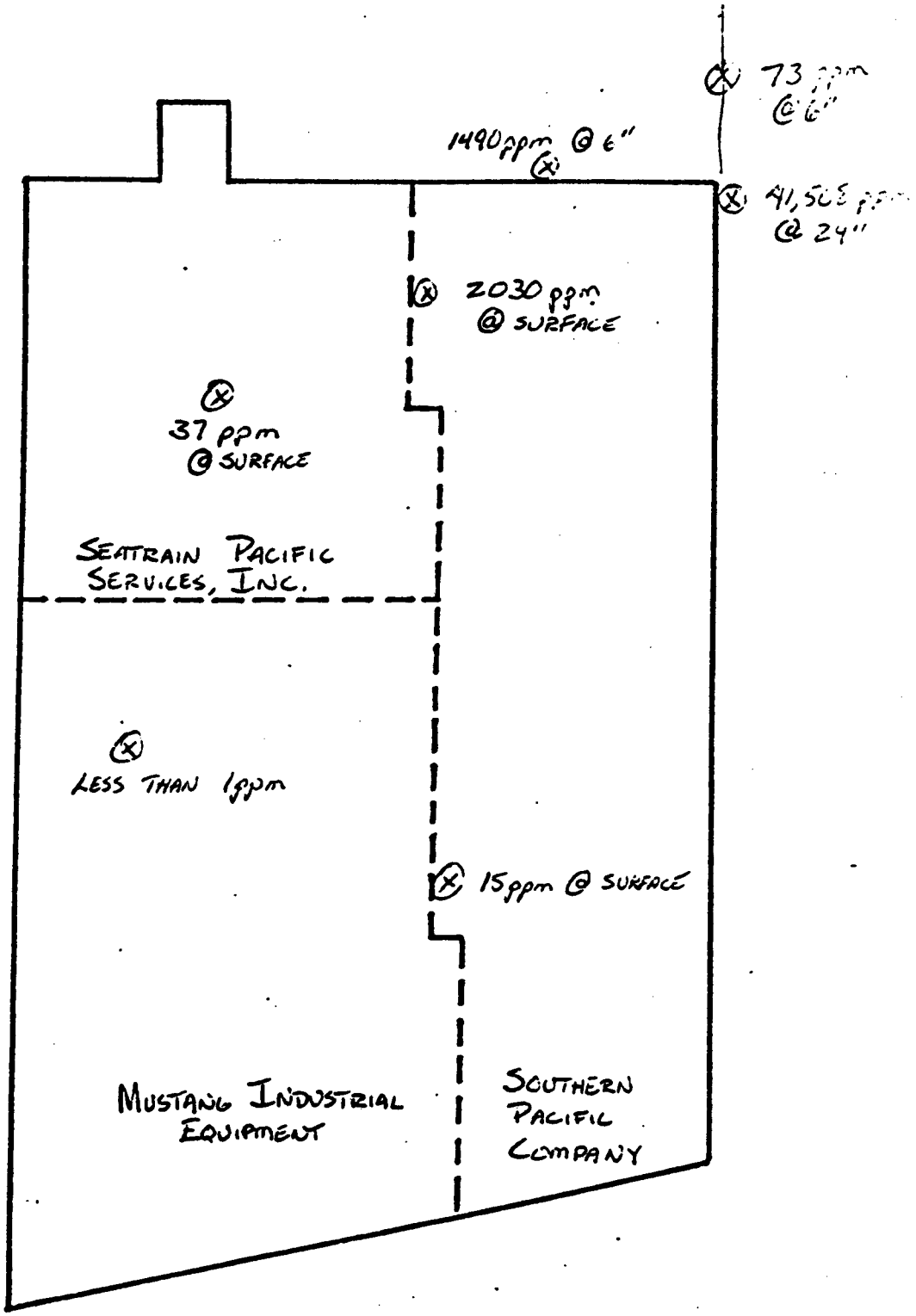


FIGURE 2.

FORMER OLIN PLANT SITE

7621 WALLISVILLE ROAD

HOUSTON, TEXAS

(ABOVE CONCENTRATIONS ARE FOR TOTAL PESTICIDES)

REFERENCE 15

Response to 104(e) Request for Information, to David Price, Superfund Enforcement, from J.R. Anderson, Manager Environmental Affairs, Olin Chemicals Group, P. O. Box 2896, Lake Charles, LA 70602, 18 November 1983 and 20 October 1983.

(15)

Olin CHEMICALS GROUP
P.O. BOX 2896 • LAKE CHARLES, LA 70602

November 18, 1983

Mr. David Price
Superfund Enforcement, 6AW-SE
Environmental Protection Agency
First International Building
1201 Elm Street
Dallas, TX 75270

Re: Former Olin Site, Wallisville Road
Houston, Texas

Dear Mr. Price:

Reference is made to our letter of October 20, 1983 regarding the referenced site. We have recently determined that the plant did at one time handle a pesticide in addition to those listed in the October 20 letter. This pesticide was an arsenic based weed killer which was not packaged or formulated at the plant but merely stocked in cases containing small bags (3-5 lbs). The active ingredient in this product was sodium methyl arsenate.

If you have additional questions in this regard please call me at (318) 491.3308.

Very truly yours,

J. R. Anderson
Manager
Environmental Affairs

JRA/eh

Olin CHEMICALS GROUP
P.O. BOX 2896 • LAKE CHARLES, LA 70602

October 20, 1983

Mr. David Price
Superfund Enforcement, 6AW-SE
Environmental Protection Agency
First International Building
1201 Elm Street
Dallas, TX 75270

Re: Former Olin Site, Wallisville Road
Houston, Texas

Dear Mr. Price:

This letter is in response to your letter of September 2, 1983 regarding the above referenced site. Your letter was received by us on September 8, 1983. On October 4, 1983 Mr. Scott of my staff telephoned you requesting an extension of time to reply to your letter. This was granted until October 21, 1983 and confirmed by our letter to you of October 5, 1983. Your cooperation in this regard is very much appreciated.

The following are answers, to the best of our knowledge, to the seven questions listed in your letter which are repeated here for clarity.

1. What is your ownership history of the site?

   Ans: Olin purchased the site including a sulfur plant from Southern Acid and Sulfur Company in 1950. Olin sold the site, on an "as-is" basis, to Eureka Investment Company of El Campo in 1973.

   During Olin's ownership they operated a sulfur plant and began dry pesticide formulation in 1950 and liquid formulation in 1955. Information on pesticide handling is presented in Exhibit A attached. The dates when the various products (by compound or trade name) were formulated are given in Exhibit B.

   Background information on the site was provided in Olin's Remedial Action Plan which was presented to your office at a meeting on December 15, 1981.

2. Upon sale of the property, what was the agreement with the buyer concerning responsibilities for site cleanup?

   Ans: There was no agreement with the buyer concerning responsibilities for site cleanup. Although Olin had no legal responsibility for any post-sale cleanup, it was our understanding that Eureka intended to take the necessary and required action to cleanup the site so as to render the property suitable for construction of factory and office buildings, and for paving of areas for storage and parking areas. The Warranty Deed dated August 3, 1973 does state that the property was granted, sold and conveyed to the buyer, "together with all improvements thereon."

3. What cleanup operations did your company perform prior to or after the sale of the property?

   Ans: After closure in 1972 and before the sale in 1973 usable pesticide formulation equipment was dismantled and shipped to Olin's plant in Leland, Mississippi which also formulated pesticides. Two truckloads of waste consisting of sweepings, equipment clean-out residues, old and obsolete products, and products in poor physical condition (torn or broken containers), were shipped to the Olin plant in Pasadena, Texas and buried in Gypsum Pile No. 1.

4. What pesticides were handled at the site? What were your pesticide handling and disposal practices on site? Please be specific as to movement and disposition of all soils, and sulfur or pesticide-laden material, dismantling equipment, resurfacing, etc. Do you have engineering plans for your work?

   Ans: Exhibit A, attached, lists the pesticides handled at the site together with handling and disposal practices on site. We do not have any more specific information as to the movement and disposition of materials. We do not have any engineering plans for equipment removal or disposal done by Olin. The demolition of the buildings, grading and paving and construction responsible for the present configuration of the site was performed by Eureka subsequent to our sale of the site.

5. Based on your knowledge, what were the disposal practices utilized by Olin on the site?

   Ans: Disposal practices for specific containers are given in the Table identified as Exhibit A. In addition, the handling of spills is described in footnote (1) of Exhibit A.

   Information on this question, and questions 3 and 4 above, was provided by Olin in the Eckhardt survey and Superfund Notice of which you have copies.

6. Please provide all data you may have characterizing the pollutants on site.

   Ans: Data we have readily available characterizing the pesticides handled at the site is presented in Exhibit C.

   Previously you were provided with information on materials on-site by letters of July 27, 1981 from Rollins Environmental Services, Inc. to Houston Belt and Terminal Railroad, and Southern Pacific Railroad, of which you received copies. Also, the sample points together with analytical results obtained by EPA were included as Exhibit F in the Remedial Action Plan that Olin presented to you on December 15, 1981.

7. Please provide a complete copy of any report(s) prepared by consultants or your staff concerning the extent of contamination of the site in question (including offsite contamination). Include any associated results of laboratory analysis.

   Ans: Samples were taken from the Houston Belt and Terminal Railroad right-of-way on the east side of the former Olin plant property by Olin personnel in January 1981. Sampling locations are shown in Exhibit D. All were soil samples except for sample No. 5 which was aqueous.

   Analytical results of the samples are presented in Exhibit E which is a report on the GC/MS analysis of the samples. Although analysis was made for a wide spectrum of pesticides only four, viz. Toxaphene, DDT, DDD and PCNB, were considered to be present in high concentrations.

If you have any questions on the above information please call me at (318) 491-3308.

Very truly yours,

J. R. Anderson
Manager
Environmental Affairs

JRA/eh

Enclosure

Raw Material To Product Handling at Olin Houston

Sulfur and Pesticide Facility per A. M. Watkins[1]

Material	Supplier	Container	Size	Color Form	Purity Conc.	Delivered by	Amt. in Storage	Where Stored	Container Disposal	Processing[2] Procedures	Product Form	Conc. in Product	Product Container	How Shipped
	Frontier	Fiber Drum	100 #	Brown Solid	hi 30-45% lo 12-16%	Truck	400 drums	dry bldg some stored outside bldg 9 under tarps	throw out back door, into trash container, most burned in on-site incinerator	remove container with axe. Dry plant-grind & blend. Liquid plt. grind and put in batch tank	Liquid dry	1.2 #/gal in xylene 3-5%	5/30/55 gal 50 # bag	truck small amt by R.R.
Dieldrin	Shell	Fiber drum	200#	off-white flakes	100%	Truck	20-50 drums	bldg 9	drums re-used for trash and/ or burned on-site	most into liquid, some ground dry & mixed with DDT & sulfur	liquid dry	1.5 lbs/ gal 2.5%	5/30/55 gal. Mostly 5 gal. 50# bag	truck
Aldrin	Shell	Fiber drum	350#	drity-brown solid	96%	Truck	20-50 drums	bldg 9	same as Dieldrin	same as Dieldrin	liquid dry	2#/gal 2.5%	same as Dieldrin	truck
DDT	Olin Montrose Diamond	Bags	100#	off-white granular	100%	Truck rail	50,000 to 100,000#	bldgs 4,9&8	bags burned on-site	blended into liquid & dry formu-lations	liquid dry	2&3 lbs per gal 5-10%	55 gal drums mostly 50# bag	truck
DDD	Rohm & Haas General Chemical		Same as DDT											
Chlordane	Velsicol	Metal Drum	300#	brown liquid	100%	Truck	20 drums	bldg 9	to re-cycler	most into liquid formula-tions. Some dry blends by 2 stage dilution	liquid dry	2#/gal 10%	5 gal 50# bag	truck

Raw Material to Product Handling at Olin Houston

Sulfur and Pesticide Facility per A. M. Watkins[1]

Raw Material	Supplier	Container	Size	Color Form	Purity Conc.	Delivered by	Amt. in Storage	Where Stored	Container Disposal	Processing[2] Procedures	Product Form	Conc. in Product	Product Container	How Shipped
Heptachlor	Velsicol	Corrugated Metal Drums	100#	white solid with free liquid sweet odor	76%	truck	20-30 drums	bldg 9	cut up & sent to city dump	formulated into liquid	liquid	2#/gal	5 gal pail	truck
Toxaphene Strobane	Hercules Tenneco	Bulk[3]	R.R. tank car	tarry when cold black liquid	90%	R.R. tank car	10,000 gal.	vertical aluminum tank	—	liquid and dry formulations	liquid dry	6#/gal 20% with 40% sulfur	55 gal 50# bag	truck
Malathion	American Cyanamid	Drum	55 gal	yellow orange liquid bad odor	95%	truck	20 drums	bldg 9	to reclaimer	mostly liquid formulations. Small am't of dust by 2 stage	liquid dust	5#/gal 5%	5 gal mostly. some 55 gal. 50 lb bag	truck
Parathion	Monsanto Stauffer American Cyanamid	Drum	55 gal	darker liquid than Malathion odor not as bad as Malathion	98.5%	truck	50 drums	bldg 9	to reclaimer	same as Malathion	liquid dust	2-4 lbs/ gal 2%	all sizes mostly 55 gal 50# bag	truck
Methyl Parathion	Same as Parathion				80%						no dust			
Sevin	Union Carbide	Bag	50#	off-white fine granular	99.5%	truck	40,000 lbs	bldg 4	burned on-site	all dry formulation	dry	5-10%	50# bag some 5 lb	truck

Raw Material To Product Handling at Olin Houston

Sulfur and Pesticide Facility per A. M. Watkins[1]

Raw Material	Supplier	Container	Size	Color Form	Purity Conc.	Delivered by	Amt. in Storage	Where Stored	Container Disposal	Processing[2] Procedures	Product Form	Conc. in Product	Product Container	How Shipped
Endrin	Shell Velsicol	fiber drum	200#	dirty brown solid	98%	truck	20 drums	bldg 9	same as Aldrin	all liquid formulations, very little made	liquid	1.6 lb/ gal	5 gal	truck
Epichloro-hydrin	Shell	drum	55 gal	off-white clear liquid	—	truck	10 drums	bldg 9	to reclaimer	not a pesti-cide. Used to extend shelf life by tying up chlorine	added to liquid formu-lations	10#/ 1000 gal	—	—
Terrachlor	Olin	bags	50#	off-white granular	98%	truck	80,000 lbs	bldg 9 & 4	mostly burned on-site. Some to city dump	some liquid made for peanuts. Most absorbed from solution onto granular clay. Some dry mixed with Terrazol and Disyston	liquid dry	2 lb/gal 10%	5/30/55 gal 50# bag	truck
Terrazol	Olin	drums	55 gal	brown liquid	95%	truck	20-50 drums	bldgs 9 & 4	to reclaimer	All absorbed onto granular clay	dry	2.5%	50# bag	truck
Methoxy-chlor	DuPont				100%									
Disyston	Chem-Agro	drum	55 gal	brown liquid	80%	truck	40 drums	bldgs 9 & 4	to reclaimer	All absorbed onto granular clay	dry	6.65%	50# bag	truck

Notes: (1) Spill handling: Dry spills were swept up into drums. This material was disposed of in a pit dug in the on-site natural clay in 1965. Subsequent material was disposed of at Pasadena Olin facility when Houston plant was closed in 1973. Liquid spills flowed by floor drains to a tank where the material was detoxified if not reused. Dry and wet spills were reused whenever possible.

(2) All liquids were filtered.

(3) Early in plant operation a small amount of 95% toxaphene was received in fiber drums.

PREPARED FROM INFORMATION
SUPPLIED BY M. WATKINS
J. A. SCOTT, 5/5/83
LAKE CHARLES, LA

PRODUCT	DATE FORMULATED
Aldrin, E. C.	3-6-58 thru 10-26-71
Aldrin, Finished Dust	6-19-57 thru 12-7-60
Aldrin, Granular	9-7-62
BHC, E. C.	5-31-57 thru 6-31-62
BHC, Finished Dusts	6-19-57 thru 7-22-63
Baytex Concentrated Dust	4-23-69
Baytex Dust	4-23-69
Baytex Granular	9-16-69
Chlordane Finished Dust	4-10-58 thru 8-12-69
4%-5% DDT - 80% Sulfur	4-17-63
2# E.C.	4-19-63 thru 2-21-64
DDT, E. C.	3-31-58 thru 5-9-69
DDT, Dust Concentrate	8-18-69
10% Dust	4-10-58 thru 4-24-63
10% DDT G.R.	6-29-70
1.5 #E.C.	3-27-58 thru 2-21-64
Dieldrin, Dust Concentrate	12-9-60 thru 1-25-61
Dieldrin, Finished Dust	12-7-60 thru 2-13-61
Endrin, E.C.	4-7-58 thru 1-25-65
Endrin, Dust Concentrate	7-24-57 thru 12-1-61
Heptachlor, E.C.	4-7-58 thru 12-14-62
Heptachlor, Finished Dust	12-7-60 thru 8-12-69
Lindane Dust	5-30-58 thru 12-7-60
Malathion, E.C.	7-11-57 thru 7-28-66

PRODUCT	DATE FORMULATED
Malathion, Dust Concentrate	4-11-61 thru 12-11-69
Malathion Finished Dust	6-4-57 thru 12-11-69
Maneb Finished Dusts	12-9-60
Methyl Parathion E.C.	1-28-59 thru 1-25-65
M. Parathion Dust Concentrate	5-4-61
Methyl Parathion Finished Dust	6-6-57 thru 7-23-65
Methyl Trithion, Emul. Concentrate	5-25-61 thru 4-10-62
Methyl Trithion, Dust Concentrate	5-10-61
Methyl Trithion, Finished Dusts	5-12-61
Nemegon	3-29-62
Parathion Ethyl E. C.	5-14-59 thru 7-14-65
Parathion, Dust Concentrate	4-11-61
Parathion, Finished Dust	4-7-58 thru 12-7-60
Parathion, Granular	8-28-70
Strobane, E. C.	3-14-61 thru 5-19-65
Strobane, Finished Dusts	2-10-61 - 6-29-61
Sevin Dust Base	4-10-63
Sevin Finished Dusts	4-10-63 - 3-26-70
Sevin, Granular	3-15-67
Terraclor, E. C.	10-4-60 thru 9-13-68
Terraclor, Dust Base	10-22-64 thru 2-11-65
Terrachlor, Finished Dusts	4-4-58 thru 8-28-70
Terrachlor, Wettable	5-25-71
Terrachlor, Granular	11-5-65 thru 3-31-71
Terrazole Wettable Powder	5-24-71

PRODUCT	DATE FORMULATED
Toxaphene, E.C.	5-25-57 thru 3-4-70
Toxaphene Finished Dust	2-25-58 thru 2-26-62
Trithion, EC	5-26-61 - 4-19-63
Trithion, Dust Base	12-1-61
Trithion, Finished Dust	12-27-60
Trithion, Granular	8-26-70
Zineb, Finished Dusts	1959 thru 1959

Exhibit C

Characterization of On-Site Pollutants at Former Olin Houston Sulfur/Pesticide Facility

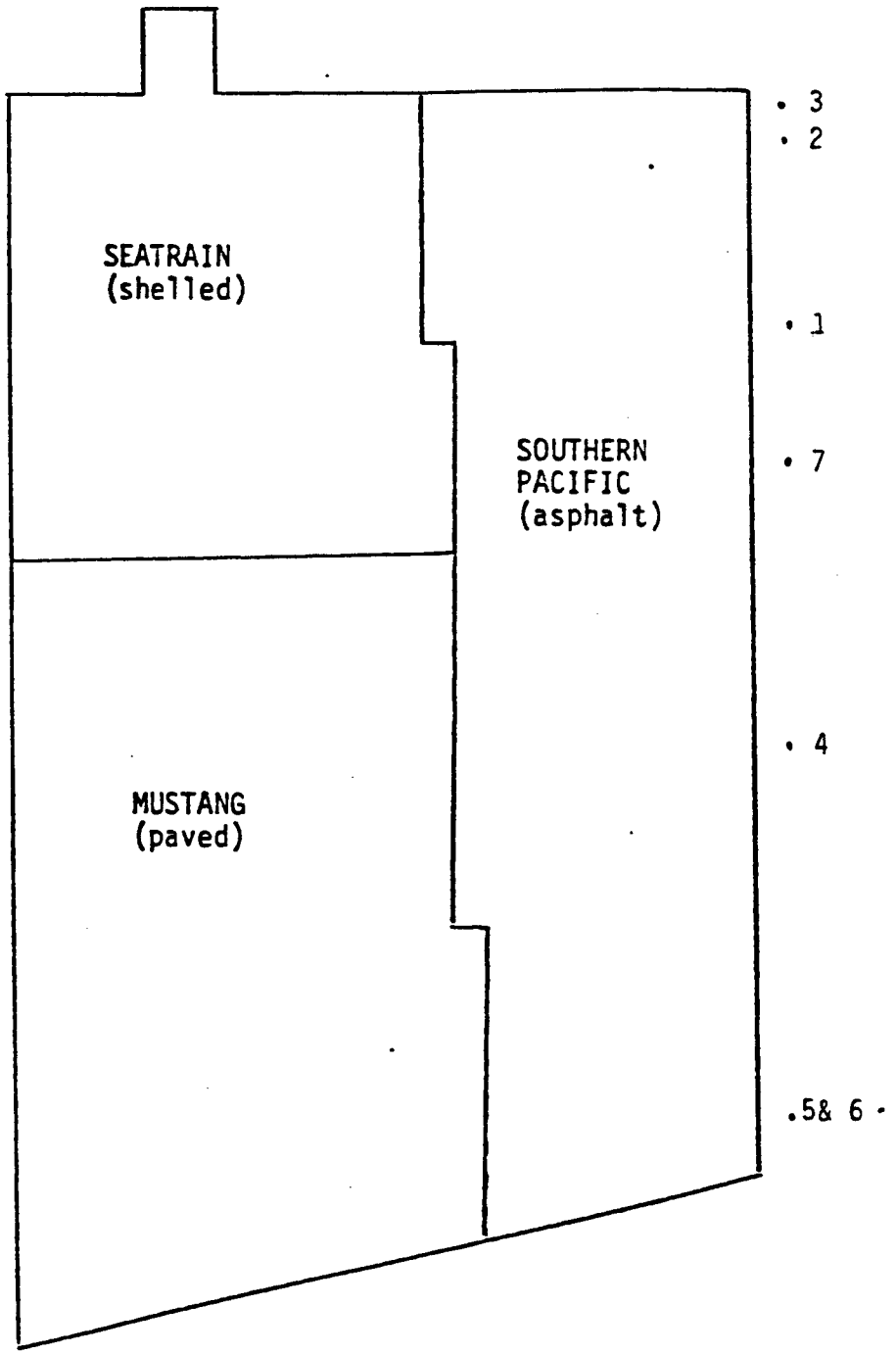
Compound	Solubility (1)	Oral LD_{50} mg/kg	Dermal LD_{50} mg/kg	TLV in Air mg/m^3
Aldrin	(i)	39	98	0.25
Arsenic (2)	(s)	-	-	-
BHC	(i)	-	-	-
Chlordane	(i)	335	840	0.50
DDD	(i)	-	-	-
DDT	(i)	113	-	1.0
Dieldrin	(i)	46	90	0.25
Endrin	(i)	17.8	-	0.10
Malathion	(ss)	1375	4444	10.0
Methyl Parathion	(ss)	14	67	-
Parathion	(i)	13	21	0.1
PCNB (Terraclor)	(i)	1750	-	-
Toxaphene	(i)	90	1075	-

Notes:
1. Relative solubility in water (ambient conditions) (i)=insoluble, (ss)=slightly soluble, (s)=soluble, (vs)=very soluble, (d)=decomposes
2. The plant did not formulate arsenic pesticides. Mono - and disodium methylarsenates were received into and distributed from the warehouse.

EXHIBIT L

SOIL SAMPLES

WALLISVILLE ROAD SITE



Samples 1-6 taken 1-15-81

Sample 7 taken 1-17-81

EXHIBIT E

TO L. Stakes AT Lake Charles DATE March 2, 1981

FROM T. Groom AT New Haven COPY TO I. A. Capuano
A. W. Sapper
J. [illegible] Anderson
J. C. Brown
T. L. Heying
V. [illegible] Norwood

SUBJECT OLD HOUSTON SULFUR PLANT DIRT SAMPLES

Seven samples pertaining to the "old Houston Sulfur Plant" have been extracted and examined by GC/MS for various pesticides as requested in the 1/19/81 memo from L. Stakes to T. Groom.

The dirt samples contain high levels of Toxaphene, DDE, DDD and PCNB. Only toxaphene was quantitated. Concentrations in dirt varied between 1314 ppm and 17.5%. Table 1 (enclosed) shows concentrations of toxaphene in the seven samples whereas Table 2 shows the qualitative distribution of the various pesticides detected. Also included is a copy of the GC/MS trace for each sample with identifications.

Two samples (①, 1384-GE and ③, 1386-GE) developed a brownish yellow precipitate on concentration of the extraction solvent. This solid was determined to be primarily elemental sulfur.

T. Groom

TC:lc
enclosures

TABLE 1
OLD HOUSTON SULFUR PLANT - DIRT SAMPLES
TOXAPHENE CONCENTRATION (ppm)

Sample	Concentration (ppm)	
① 1384-CE A53852-5 7364M	49687	(5.0%)
② 1385-CE A53851-4 7358M	1833	(0.18%)
③ 1386-CE A53849-5 7363M	174778	(17.5%)
④ 1387-CE A53847-6 7361M	1314	(0.13%)
⑤ 1388-CE A53853-5 7365M	Aqueous Sample	
⑥ 1389-CE A53648-5 7359M	2166	(0.22%)
⑦ 1390-CE A53850-5 7360M	1565	(0.16%)

TABLE 2
OLD HOUSTON SULFUR PLANT - DIRT SAMPLES

	① 1384-CE	② 1385-CE	③ 1386-CE	④ 1387-CE	⑤ 1388-CE (Aqueous** Sample)	⑥ 1389-CE	⑦ 1390-CE
Toxaphene	x	x	x	x		x	x
DDT	x	x	x	x		x	x
DDD	x	x	x	x	x	x	x
Parathion							x
Methyl Parathion	x	x					
Chlordane	x	x	x	x		x	x
BHC	x	x	x	x		x	x
Aldrin			x	x		x	x
Dieldrin						x	
Endrin		x				x	x
Malathion	x						
Heptachlor							
TERRACLOR® (PCNB)	x	x	x	x			x
TERRAZOLE®							
Sevin							

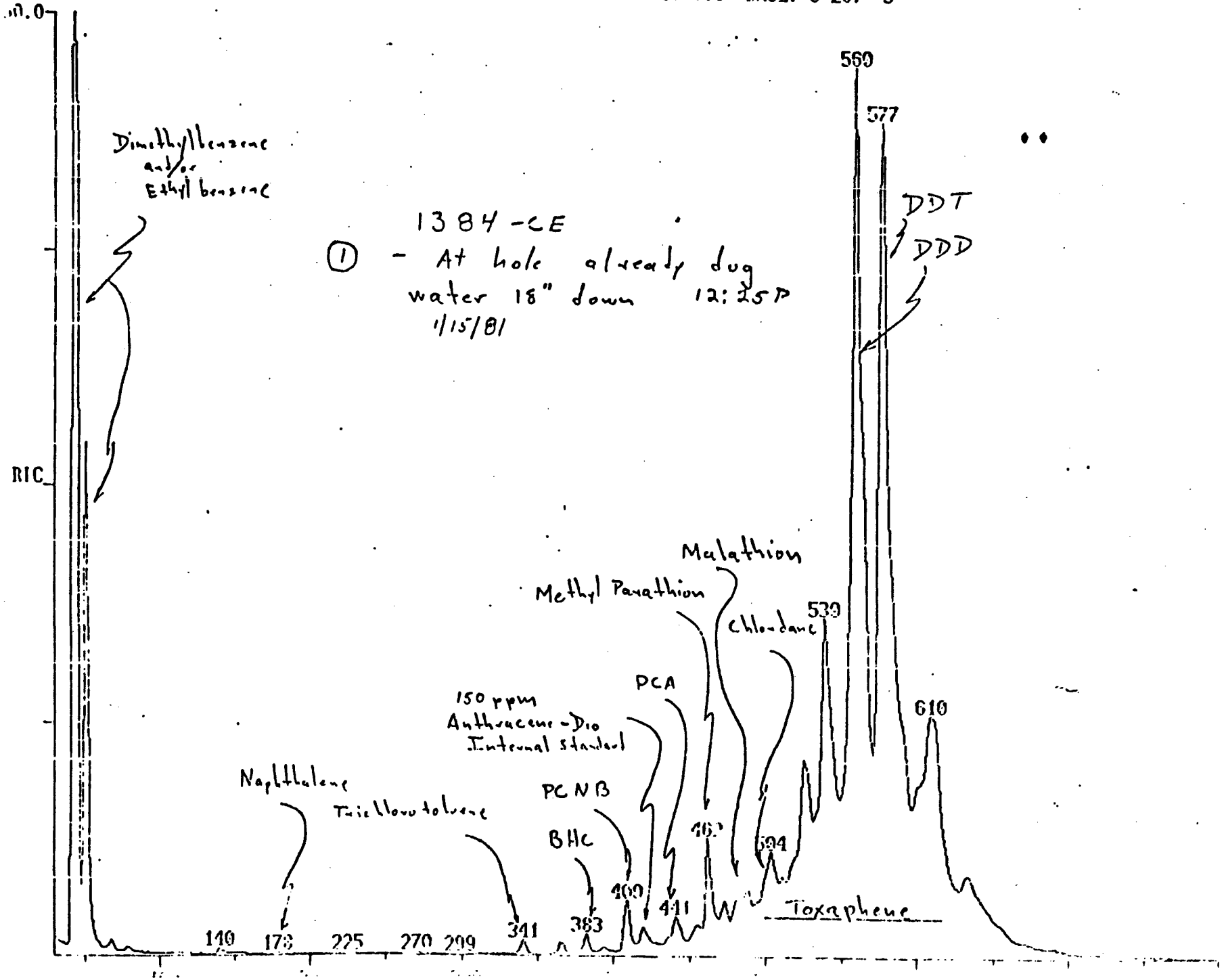
x indicates detected

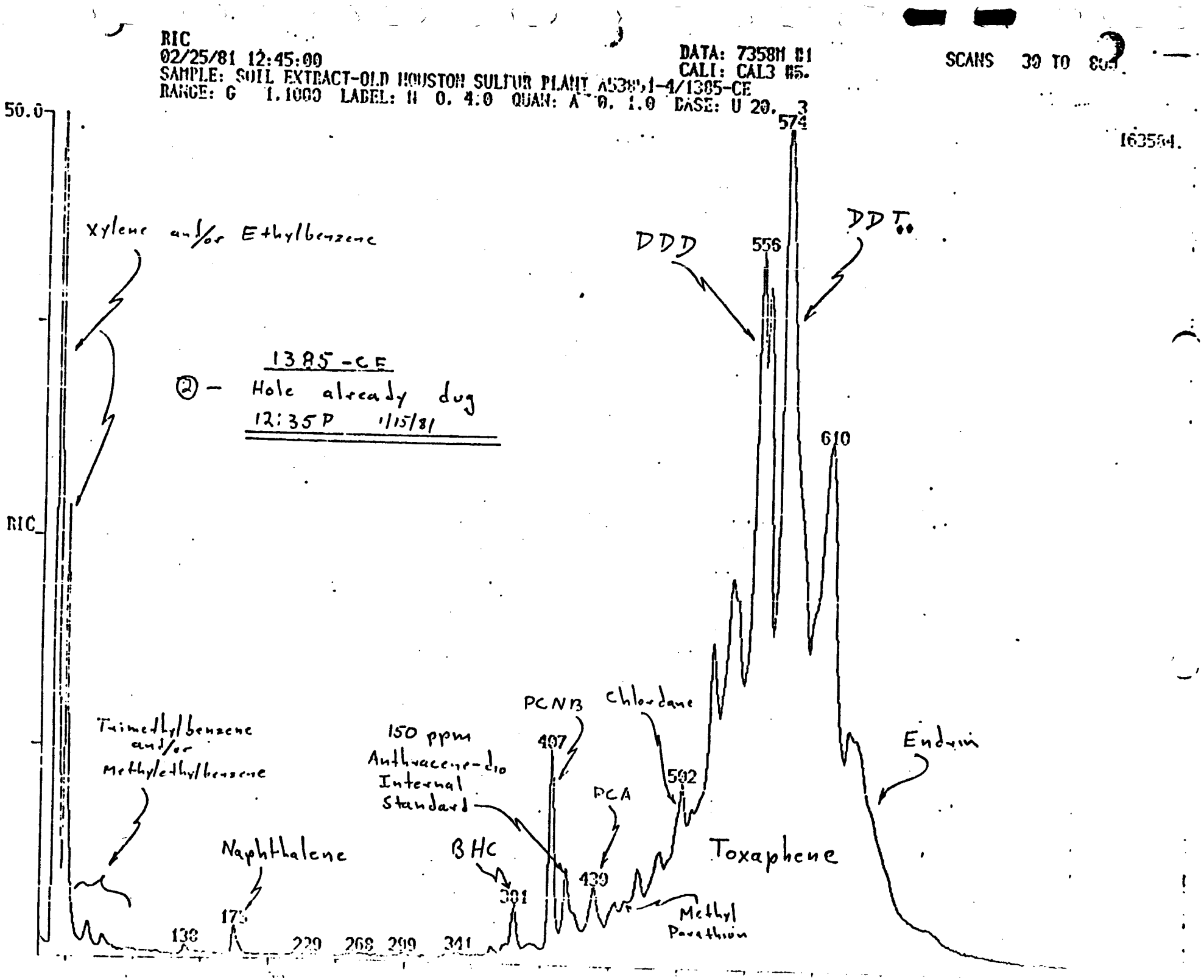
RIC
02/26/81 10:22:00
SAMPLE: OLD HOUSTON SULFUR PLANT SOIL EXT 1 OF 52MLS 1384-CE A53852-5 1
RANGE: G 1.1000 LABEL: N 0. 4.0 QUAN: A 0. 1.0 BASE: U 20. 3

DATA: 7364M 01
CALI: CALI 05

SCANS 30 TO [redacted]

684032.




RIC
02/25/81 12:45:00
SAMPLE: SOIL EXTRACT-OLD HOUSTON SULFUR PLANT A538,1-4/1385-CE
RANGE: G 1.1000 LABEL: H 0. 4.0 QUAN: A 0. 1.0 BASE: U 20. 3
DATA: 7358H B1
CALI: CAL3 85.
SCANS 30 TO 80
50.0
RIC
163564.
Xylene and/or Ethylbenzene
1385-CE
② - Hole already dug
12:35P 1/15/81
DDD
556
574
DDT
610
PCNB
chlordane
407
150 ppm
Anthracene-d10
Internal
Standard
PCA
592
Endrin
Trimethylbenzene
and/or
Methylethylbenzene
Naphthalene
175
BHC
391
439
Toxaphene
Methyl
Parathion
138
229
268
299
341

02/25/81 9:30:69
SAMPLE: OLD HOUSTON SULFUR PLANT SOIL EXT (1386-CE) A-53849-5 1UL
RANGE: G 1.1000 LABEL: N 0. 4.0 QUAN: A 0. 1.0 BASE: U 20. 3
DATA: [illegible] CALI: CALI 05 SCANS 30 TO 8[illegible]

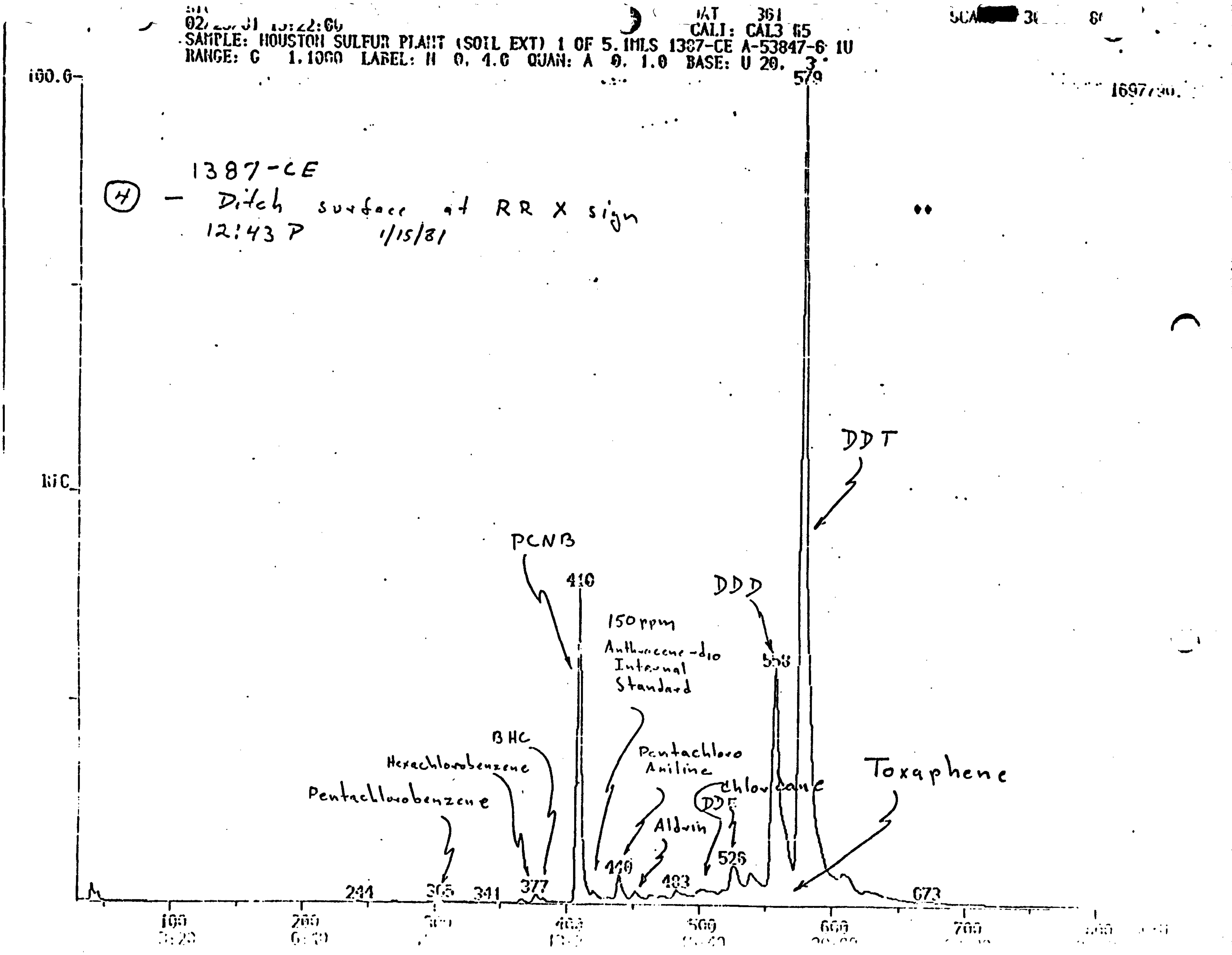
3145720.

1386-CE
③ - Pile 12:40 P 1/15/81

572
623
DDT
DDD
545
chlordane
Pentachloronitrobenzene
410 Pentachloro Aniline
Toxaphene
506
Anthracene-D10 Internal Standard 150 ppm
Pentachlorobenzene
Hexachlorobenzene
BHC
Aldrin
410
266
355
49

RIC

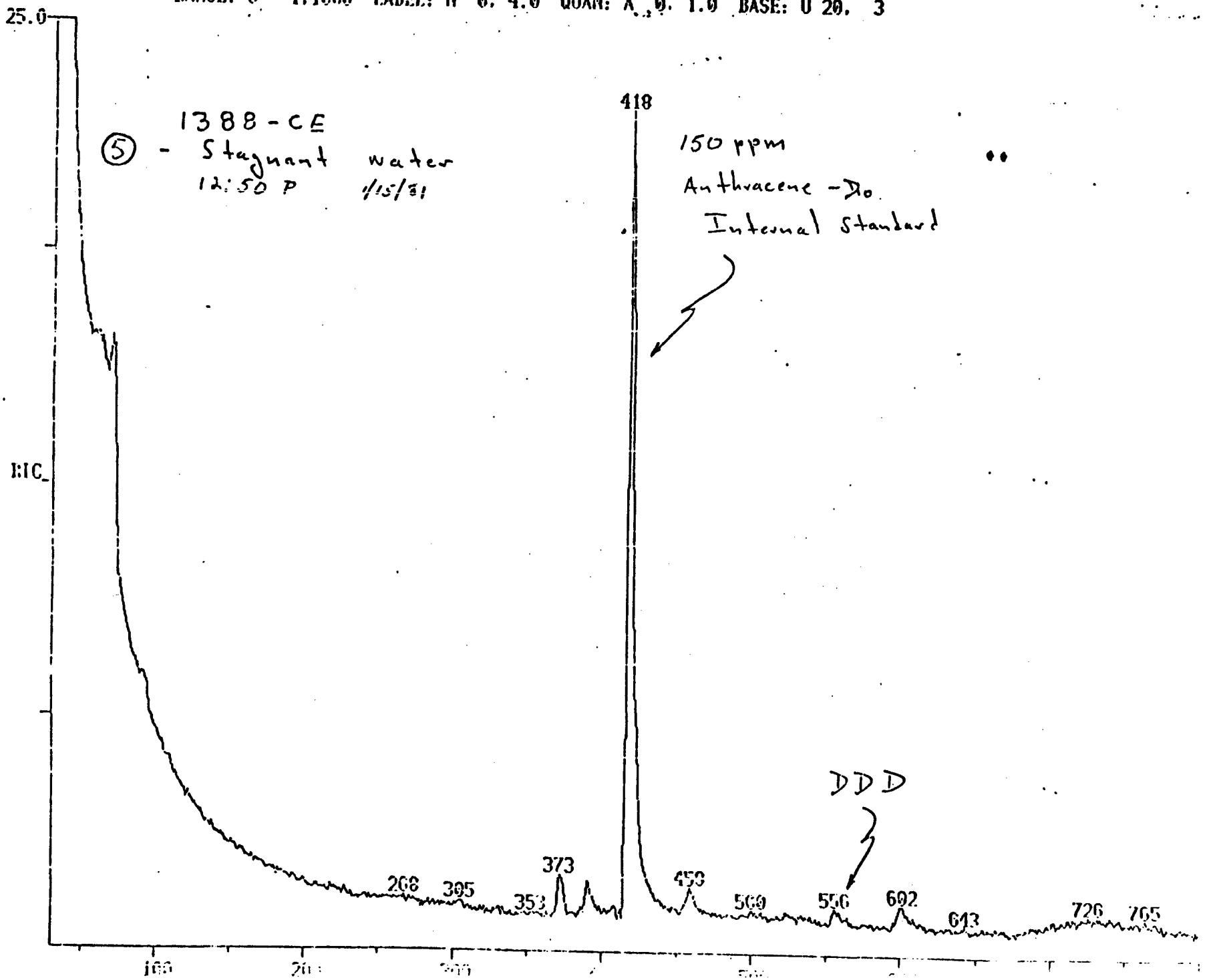
100 200 300 400 500 600



SAMPLE: HOUSTON SULFUR PLANT (SOIL EXT) 1 OF 5.1MLS 1387-CE A-53847-6 1U
RANGE: G 1,1000 LABEL: N 0, 4.0 QUAN: A 0, 1.0 BASE: U 20, 3
CALI: CAL3 65
SCA[redacted] 30
100.0
1697
RIC
1387-CE
(4) - Ditch surface at RR X sign
12:43 P 1/15/81
DDT
579
PCNB
410
DDD
558
150ppm
Anthracene-d10
Internal
Standard
BHC
Hexachlorobenzene
Pentachlorobenzene
Pentachloro
Aniline
Chlordane
DDE
Aldrin
Toxaphene
244
305
341
377
440
483
526
673
100
200
400
500
600
700

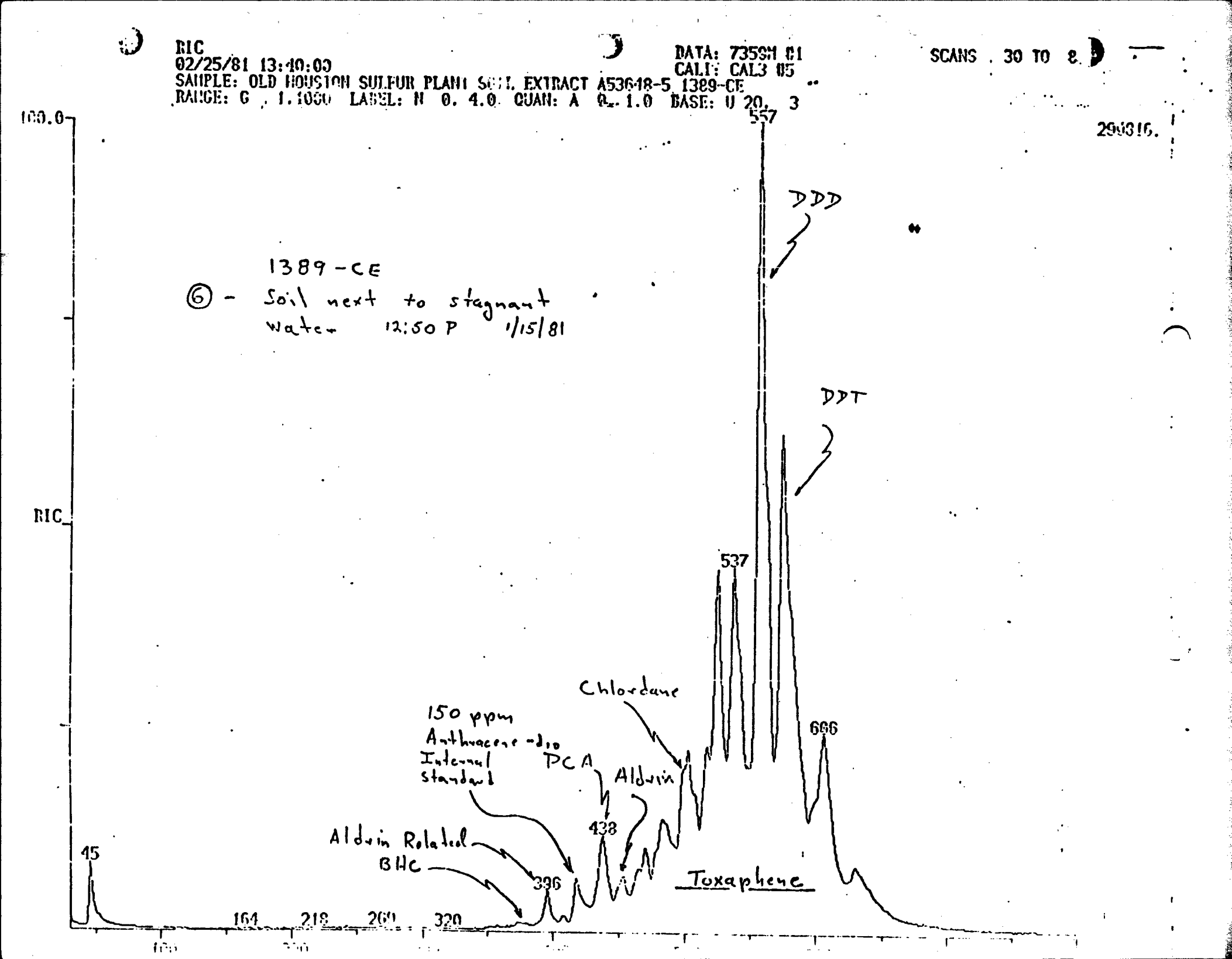
RIC
02/26/81 12:35:00 DATA: 7365M 81 SCANS 30 TO 8
SAMPLE: A53853-5 1388-CE OLD HOUSTON SULFUR PLANT 3UL INJ. 25UL D10/ML CALI: CALI 05
RANGE: G 1.1000 LABEL: H 0. 4.0 QUAN: A 0. 1.0 BASE: U 20. 3

13184



1388-CE
(5) - Stagnant water
12:50 P 1/15/81

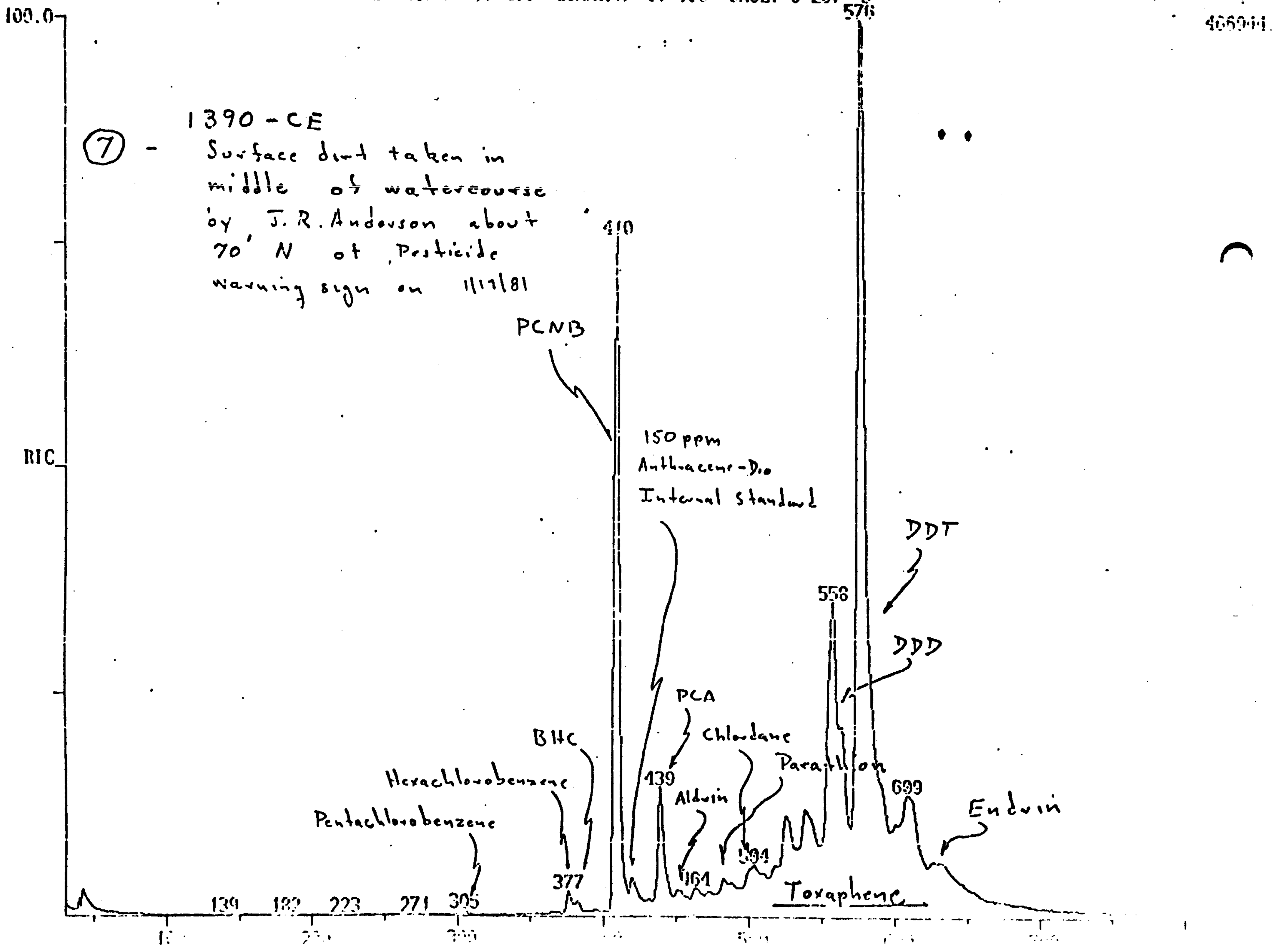
150 ppm
Anthracene - D10
Internal Standard


RIC
02/25/81 13:40:03
SAMPLE: OLD HOUSTON SULFUR PLANT SOIL EXTRACT A53648-5 1389-CE
RANGE: G , 1.1000 LABEL: N 0. 4.0 QUAN: A 0. 1.0 BASE: U 20. 3
DATA: 7359H 01
CALI: CAL3 05
SCANS . 30 TO 8
100.0
RIC
557
296316.
DDD
1389-CE
⑥ - Soil next to stagnant water 12:50 P 1/15/81
DDT
537
666
Chlordane
150 ppm Anthracene-d10 Internal standard
PCA
Aldrin
438
Aldrin Related
BHC
396
Toxaphene
45
164
218
260
320

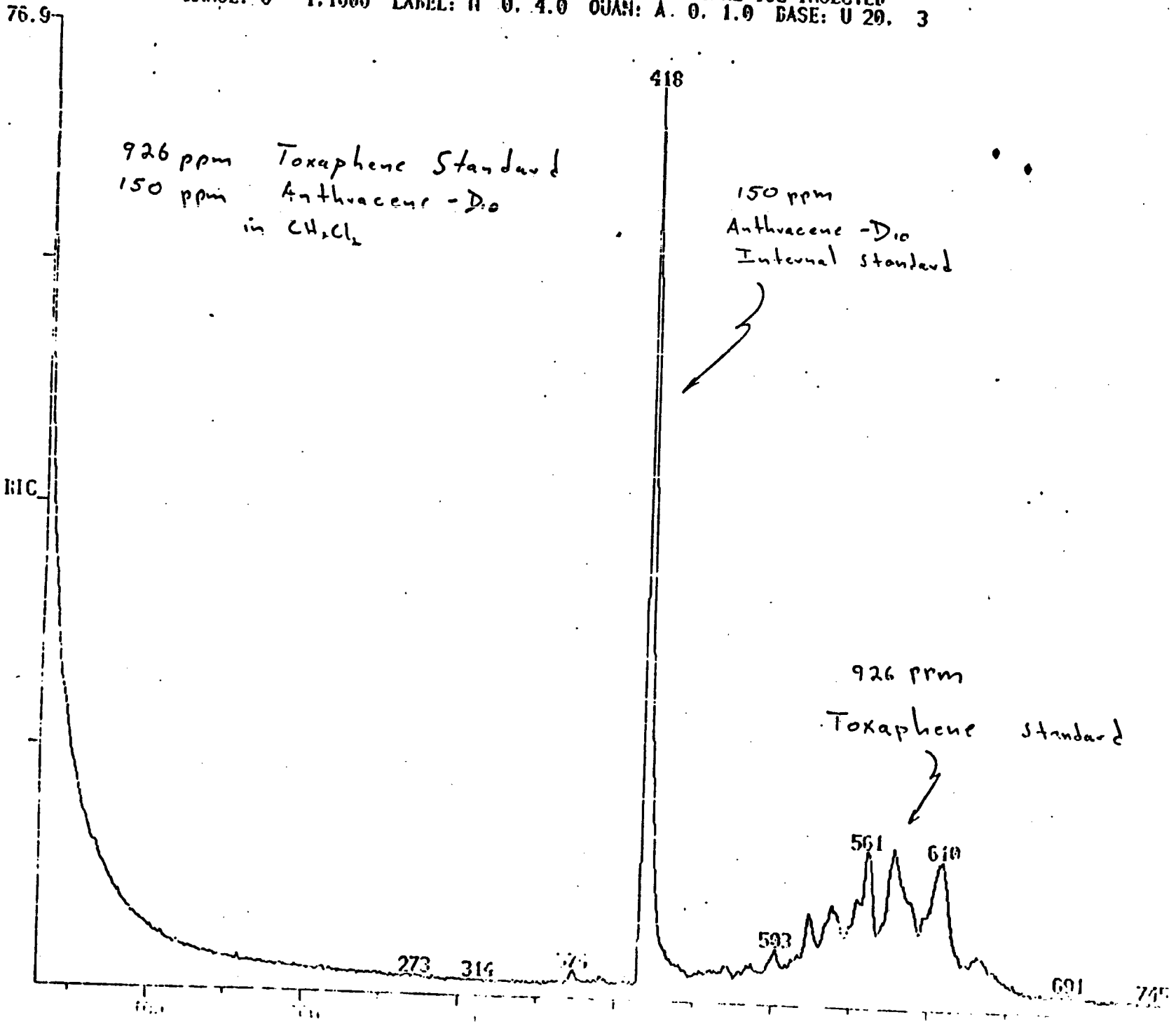
RIC
02/25/81 14:35:00
SAMPLE: HOUSTON SULFUR PLANT SOIL EXT 1390-CE 1 OF 5.5MLS A-53850-5 1UL
RANGE: G 1.1000 LABEL: N 0, 4.0 QUAN: A 0, 1.0 BASE: U 20, 3

DATA: 7360M 01
CALI: CAL3 05

SCANS 30 TO 8



RIC
02/26/81 13:19:00 DATA: 7366M B1
SAMPLE: TOXAPHENE STD 926PPM IN CH2CL2 75UL D10/1L 1UL INJECTED CALI: CAL1 B5
RANGE: C 1.1000 LABEL: H 0. 4.0 QUAN: A 0. 1.0 BASE: U 20. 3 SCANS 30 TO 8



REFERENCE 16

A-fidavit of A. Max Watkins, Regional Safety Manager, Olin Chemicals Group, 3 May 1983.

Campbell (16)

Olin

RESEARCH CENTER, 275 SOUTH WINCHESTER AVENUE, P.O. BOX 30-275,
NEW HAVEN, CONNECTICUT 06511

(203) 789-5000

May 3, 1983

Craig Campbell, Esquire
Solid Waste & Emergency Response
Team (6ORC)
U. S. Environmental Protection Agency
1201 Elm Street
Dallas, Texas 75270

Re: Wallisville Road
Houston, Texas

Dear Mr. Campbell:

Herewith enclosed please find a completed and executed Affidavit, dated May 3, 1983, of A. Max Watkins of the Olin Corporation concerning the operational and waste disposal history of Olin's former manufacturing facility at Wallisville Road, Houston, Texas.

As you will recall, during our meeting, on March 18, 1983, your associates raised a number of questions regarding the past history of Olin's operation of our former Houston facility. I believe you will find that the substantive provisions of the enclosed Affidavit address the concerns raised by you and Messrs. Nott and Price. However, if EPA still has any further questions, please feel free to call me and I will be more than pleased to supplement this Affidavit to the extent we have the requisite knowledge or have access to the required information.

Further our discussions of March 18, I understand that EPA, effective April 15, 1983, has reinstated the use of Administrative Orders to settle Superfund and related solid waste disposal cases. During our meeting we were advised that because of the Agency's "no administrative settlement" policy, the Wallisville Road (and also Ellender Ferry) matter could not be settled through Administrative Agreement. In light of the new policy, Olin is hopeful that both of these pending administrative cases can be concluded without any further delay so that final investigation, clean-up and closure of these sites can be expedited.

My Direct Dial Number:

203-789-5330

OLIN CORPORATION

AFFIDAVIT OF
A. MAX WATKINS

The Deponent, A. Max Watkins of Little Rock, Arkansas, herein affirms that the statements, representations and matters contained in this Affidavit are true to the best of his information and belief:

1. The Deponent began his employment with Olin Mathieson Chemical Corporation (a predecessor of Olin Corporation) on or about December 19, 1955 and presently is employed with the Olin Corporation, Little Rock, Arkansas, as Regional Safety Manager, Olin Chemicals Group.

2. In May, 1957, said Deponent was transferred to Olin's Houston Sulfur Plant, located on Wallisville Road, Houston, Texas where he was involved in supervising the production and quality control of dry and liquid pesticides and sulfur products. In 1950, Olin began formulating dry pesticides at this facility.

3. In March, 1966, the Deponent was promoted to Operations Superintendent of the Houston Sulfur Plant which included responsibility for the plant's production and maintenance of the total plant facilities.

4. In August, 1967, the Deponent was appointed Plant Manager of the Houston Sulfur Plant which included responsibility for directing all activities of this facility. The Deponent continued in this position until October 1, 1972 when he was appointed Superintendent, Shipping and Receiving at Olin's Pasadena Facility, Pasadena, Texas.

5. The Deponent continued to retain overall responsibility for the Houston Sulfur Plant until its official closure in December, 1972.

6. During the Deponent's tenure at the Houston Sulfur Plant, there were no waste ponds or other similar facilities constructed or maintained, for the on-site disposal of raw materials, intermediates, products, by-products, or chemical wastes, from the Plant's operations. Nor is the Deponent aware that such practices ever occurred at this facility. Therefore, the drawings appended to EPA's Photographic Analysis of the Olin Hazardous Waste Site, Houston, Texas, are in error when they make reference to waste ponds, dump areas, or similar designations suggesting on-site burial, dumping or disposal of operational wastes.

7. There were, however, two fire ponds, constructed on the aforesaid premises during the Deponent's tenure at this facility, which only contained rainwater and wellwater and were never used as a location or facility for disposal of any chemicals or chemical wastes. The purpose of these ponds was to provide sufficient quantities of water in the case of a fire, explosion or other similar occurrence.

8. The designation "dump area", contained in the aforesaid diagrams, is also inconsistent with the practices, policies and procedures followed at Olin's Houston Sulfur Plant, during the Deponent's tenure, and inconsistent with and contrary to the Deponent's knowledge of this site's operational history. In short, the Deponent has no knowledge or information in connection with any burial, dumping or other disposal of any chemicals or chemical wastes other than the disposal conducted in the latter part of 1972, by Olin, subsequent to the closing of this facility, and more particularly described infra.

9. The alleged dump areas, characterized in Figures 6, 7, 8, 9 and 10, cannot be accounted for other than as a result of vehicular traffic, grading and a variety of construction related activities.

10. As noted, Olin did conduct limited on-site disposal in only one instance and that occurred on or about 1965. This on-site disposal consisted of the construction of a pit in the natural dense clay of the site to a depth of approximately six(6) feet and a width of approximately thirty (30) feet, rectangular in shape, located at the western boundary of the Wallisville Road property and is designated as Facility #16 in the attached site diagram (Exhibit A).

11. The Deponent states that based on his direct knowledge and information only a limited amount of sulfur, trash, miscellaneous rubble, and unknown (small) amounts of pesticides were buried in this pit. The amount of pesticides buried in this pit was not significant and only consisted of product wastes and did not include any raw materials or intermediates.

And further, the Deponent saith not.

A. Max Watkins
Olin Corporation
Little Rock, Arkansas

STATE OF CONNECTICUT

COUNTY OF NEW HAVEN

On this 2nd day of May, 1983, before me the Subscriber, personally appeared, A. Max Watkins, who being duly sworn on his oath, doth depose and prove to my satisfaction that he is the said Deponent herein.

Notary Public

My Commission Expires: 3/31/88

SITE OF FORMER OLIN HOUSTON SULFUR AND PESTICIDE FACILITY

1 FORME OLIN LOT - NOW SEATRAIN ENTRANCE

2 SULFUR STORAGE

3 TOXAPHENE TANK

4 DRY PRODUCTS FORMULATION

5 CHANGE HOUSES

6 PUMP HOUSE & FIRE PONDS

7 OFFICE

8 STORAGE

9 LIQUID PRODUCTS FORMULATION

10 RAMP

11 RAILROAD SPUR

12 DRAINAGE

13 CHAIN-LINK FENCE

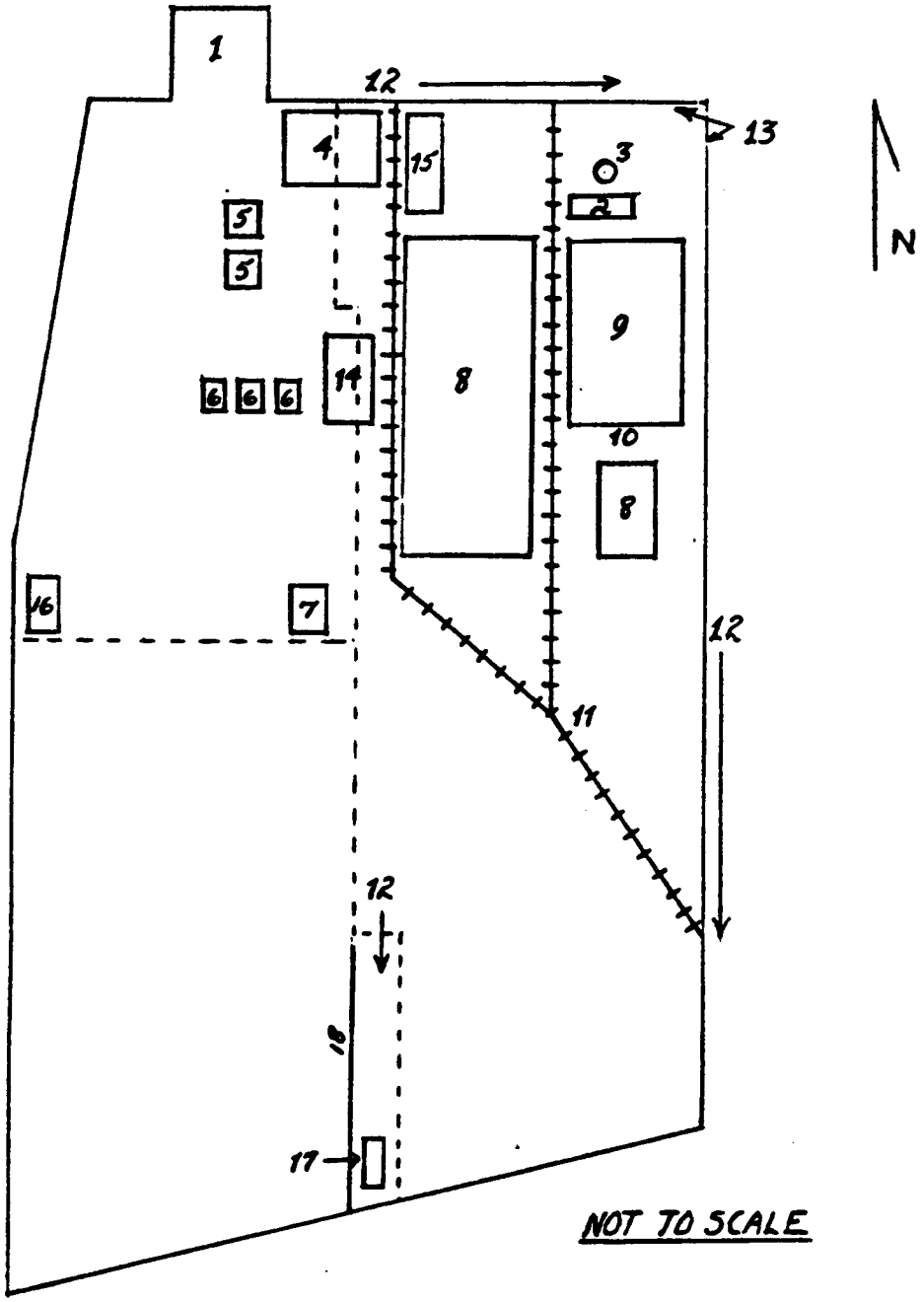
14 BLACKBIRD HOUSE

15 SHOP & PARTS WAREHOUSE

16 PIT

17 SIGN

ENTRANCE ROAD



CURRENT INDUSTRIAL PROPERTY LINES

DRAWN FROM SKETCH SUPPLIED BY A.M. WATKINS 3/31/83
BY J.A. SCOTT 4/7/83

REFERENCE 17

HRS Support for Olin Corp., Wallisville Road Site, Houston, TX, prepared by R.W. Roblin, 22 January 1986, with attachments as follows:

Texas Water Development Board, Report 203, March 1976.

Texas Water Development Board, Report 190, February 1975.

Aquifer descriptions are referenced to the Geologic Atlas of Texas, Houston Sheet, February 1968.

ECOLOGY AND ENVIRONMENT, INC.,

REGION VI

MEMORANDUM

TO: Keith Bradley, Region VI RPO

FROM: R.W. Roblin, FIT Geologist

THRU: K.H. Malone Jr., FIT RPM

DATE: January 22, 1986

SUBJ: HRS Support for Olin Corp., Wallisville Road Site, Houston, TX. (TX1538)
TDD R6-8512-18

The FIT was tasked to provide HRS support for the Old Olin, Wallisville Road Site, in Houston Texas. Specifically, the FIT was to provide a description of the Montgomery Formation, the overlying Beaumont Formation and to determine the highest seasonal water level of the Beaumont Formation with approximate unit thicknesses in the area of the site.

The Montgomery Formation and the Beaumont Formation are in the Quaternary System and are the two upper units of the Chicot Aquifer. The lower unit, the Montgomery Formation, is composed of alternating clays, silts, sand and very minor silicarous gravel of granule and small pebble size with an approximate thickness of 100+ feet in the investigation area. The upper member, the Beaumont Formation, lies stratigraphically above the Montgomery Formation and is a series of natural levee, backswamp, stream channel, and point bar deposits of alternating clays, silts, and sands. The two units are hydraulically connected by a basel sand. The Beaumont Formation is approximately 100+ feet thick in the investigation area and is the outcropping unit in Houston. The Beaumont Formation's seasonal water levels are between 30' - 45'.

Descriptions of the Beaumont and Montgomery Formations are referenced to the Geologic Atlas of Texas, Houston Sheet, February 1968. Water level of the Beaumont Formation is referenced to well number LJ-60-60-909 of the Texas Water Development Board Report 203, March 1976. The stratigraphic column is referenced to the Texas Water Development Board Report 190, February 1975.

Well LJ-60-60-909
Owner: Leonard Renfer
Driller: Schoppa Water Well Service

	THICKNESS (FEET)	DEPTH (FEET)
Topsoil	5	5
Clay	40	45
Sand	15	60
Clay	45	105
Sand	4	109
Clay	36	145
Sand	5	150
Clay	19	169
Sand	15	184

Well LJ-60-60-910
Owner: Klein Independent School District Well 2
Driller: T. C. Bussell and Son

Topsoil	3	3
Unconsolidated	347	350
Sand and rock, broken	54	404
Shaly area	30	434
Sand, coarse	21	455
Shale	21	476

Well LJ-60-61-101
Owner: Shasla Public Utility District
Driller: Layne-Texas Co.

Clay	114	114
Sand	33	147
Shale	18	165
Sand	30	195
Shale and sandy shale	55	250
Shale, sandy and sand	20	270
Sand	54	324
Shale	4	328
Sand	39	367
Shale, sandy	48	415
Sand and gravel	70	485
Shale	68	553
Sand and streaks of lime	31	584
Shale, sandy	14	598

Well LJ-60-61-101--Continued

Shale	103	701
Sand	33	734
Shale, sandy and lime streaks	30	764
Sand, fine, shale and lime streaks	128	892
Shale	35	927
Sand	62	989
Sand and shale streaks	50	1,039
Shale	16	1,055
Shale, sandy and sand streaks	50	1,105
Shale	45	1,150

Well LJ-60-61-407
Owner: Dove Meadows Municipal Utility District
Driller: Dickson Drilling Co.

Surface formation	60	60
Shale	35	95
Sand with shale strips	110	205
Shale	60	265
Sand with shale strips	120	385
Shale with sand strips	30	415
Sand	75	490
Shale	108	598
Sand	24	622
Shale	113	735
Sand	13	748
Shale	57	805
Sand	131	936
Shale	20	956
Sand with clay strips	18	974
Shale	12	986
Sand	16	1,002
Shale	42	1,044
Sand	38	1,082
Shale	46	1,128

Table 1.--Records of Wells in Harris County

Water levels : Reported water levels given in feet; measured water levels given in feet and tenths.
Method of lift and type of power: C, cylinder; E, electric; G, gasoline, butane, or diesel engine; Ng, natural gas; J, jet; Sub, submersible; T, turbine; N, none. Number indicates horsepower.
Use of water : D, domestic; Ind, industrial; Irr, irrigation; P, public supply; S, livestock; N, none.
Water-bearing unit : C, Chicot aquifer; CU, upper unit of Chicot aquifer; CL, lower unit of Chicot aquifer; E, Evangeline aquifer.

No.	Owner	Driller	Date completed	Depth of well (ft.)	Casing		Water-bearing unit	Altitude of land surface (ft.)	Water level		Method of lift	Use of water	Remarks
					Diameter (in.)	Depth (ft.)			Above (+) or below land surface datum (ft.)	Date of measurement			
LJ-60-49-804	(b) (6)	Falkenbury Drilling Co.	1971	220	6 4	168 220	E	300	97	July 7, 1971	Sub,E 10	Irr	30 feet of screen between 169 and 219 feet. Supplies lake. 1/
58-404		Doyle's Water Well Service	1970	244	4	244	C	231	109	Jan. 27, 1970	Sub,E 1	D	Screen from 234 to 244 feet.1/
405		Texas Water Wells, Inc.	1974	1,276	16 8	486 1,276	E	260	185	May 1974	T,E	Irr	407 feet of slotted pipe between 286 and 1,266 feet. Reported yield 2,000 gal/min with 82 feet drawdown when drilled.1/
59-311	Harris County Spring Creek Park	H&H Water Well Drilling	1972	416	6 4	360 416	E,C	225	95	Jan. 3, 1972	Sub,E	Irr,P	Supplies recreation facilities.1/
312	do.	A. Chrysty Kuhlmann	1959	274	4	274	C	215	--	--	Sub,E 5	--	Screen from 244 to 274 feet.
# 313	Tomball Independent School District	Layne-Texas Co.	1973	455	10 6	375 455	E	220	94	Apr. 11, 1973	T,E	P	50 feet of screen between 385 and 443 feet. Reported yield 250 gal/min with 146 feet drawdown when drilled.1/
703	(b) (6)	Borgstedt Well Service	1971	292	4	292	C	160	--	--	Sub,E 5	Irr	Screen from 270 to 292 feet.1/
# 60-306	Worchester Municipal Utility District, Northampton	Layne-Texas Co.	1972	1,612	16 10	1,363 1,612	J	144	Flowing	Aug. 14, 1972	T,E 100	P	145 feet of screen between 1,374 and 1,600 feet. Reported yield 1,034 gal/min with 11 feet drawdown when drilled. Test hole drilled to 1,900 feet.1/
805	(b) (6)	Schoppa Water Well Service	1971	465	4 2 1/2	441 465	C	138	115	May 3, 1971	Sub,E 5	D	21 feet of screen between 437 and 465 feet.1/
908	Spring Creek Forest	Texas Water Wells, Inc.	1972	672	12 8	506 672	C,E	124	134	Dec. 1971	T,E 125	P	149 feet of screen between 426 and 662 feet. Reported yield 1,051 gal/min when drilled. Test hole drilled to 1,166 feet.
909	(b) (6)	Schoppa Water Well Service	1971	184	4 2 1/2	172 184	C	125	45	Mar. 9, 1971	--	Irr	Screen from 174 to 184 feet.1/
910	Klein Independent School District, well 2	T. C. Bussell & Son	1972	476	6 4	357 476	C	124	113	Apr. 7, 1972	Sub,E	P	42 feet of screen between 383 and 455 feet. Reported yield 150 gal/min with 30 feet drawdown when drilled.1/
# 61-101	Shaela Public Utility District	Layne-Texas Co.	1973	1,000	16 10	540 1,000	E	135	142 139.8	June 23, 1973 May 30, 1974	T,E 75	P	165 feet of screen between 550 and 985 feet. Reported yield 1,022 gal/min with 54 feet drawdown when drilled.1/
# 407	Dove Meadows Municipal Utility District	Dickson Drilling Co.	1972	1,092	10	1,092	E	136	79	Apr. 10, 1972	T,E 40	P	192 feet of screen between 804 and 1,082 feet. Reported yield 1,001 gal/min with 51 feet drawdown when drilled.1/
# 408	Cypresswood Municipal Utility District	Layne-Texas Co.	1973	1,150	16 10	880 1,150	E	122	158	July 2, 1973	T,E	P	180 feet of screen between 890 and 1,130 feet. Reported yield 1,033 gal/min with 46 feet drawdown when drilled.1/

See footnotes at end of table.

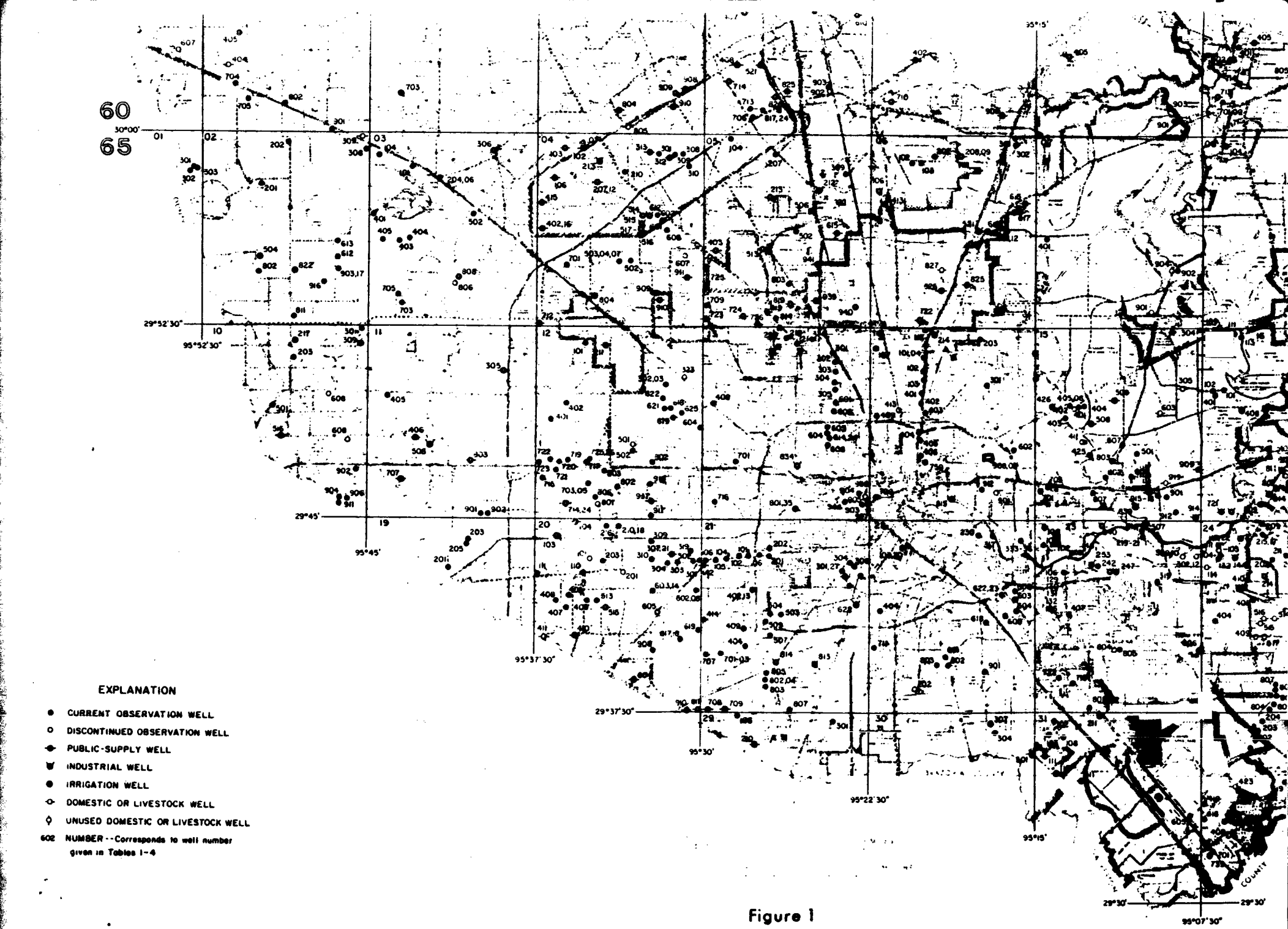


Figure 1

Locations of Wells in Harris County

Table 1.—Geologic and Hydrologic Units Used in This Report and In Recent Reports on Nearby Areas

This report				Wood and Gabrysch (1965)	Sandeen and Wesselman (1969)	Wilson (1967)	Popkin (1971)	Lang, Winslow, and White (1950)	Pettit and Winslow (1957)	Wesselman (1971)	Anders and others (1968)	Wesselman (1972)
System	Series	Stratigraphic unit	Aquifer	Houston district	Brazoria County	Austin and Waller Counties	Montgomery County	Houston district	Galveston County	Chambers and Jefferson Counties	Liberty County	Fort Bend County
Quaternary	Holocene	Quaternary alluvium				Alluvium of the Brazos River		Alluvial deposits	Beach and dune sand			
	Pleistocene	Beaumont Clay	Chicot aquifer — Upper unit	Confining layer and Alta Loma Sand of Rose (1943)	Chicot aquifer — Upper unit	Evangeline aquifer (May contain unidentifiable parts of basal Chicot aquifer along the edges of Brazos River flood plain or along southern part of both counties)	Chicot aquifer	Beaumont Clay	Beaumont Clay	Chicot aquifer — Upper unit	Chicot aquifer	Chicot aquifer — Upper unit
		Montgomery Formation						"Alta Loma Sand"	"Alta Loma Sand"			
		Bentley Formation	Chicot aquifer — Lower unit		Chicot aquifer — Lower unit			Zone 7	Lissie Formation	Chicot aquifer — Lower unit		Chicot aquifer — Lower unit
		Willis Sand						Zone 6				
Tertiary	Pliocene	Goliad Sand	Evangeline aquifer	Heavily pumped layer	Evangeline aquifer		Evangeline aquifer	Zone 5		Evangeline aquifer	Evangeline aquifer	Evangeline aquifer
	Miocene	Fleming Formation	Burkeville confining layer	Zone 2		Burkeville aquiclude	Burkeville aquiclude			Burkeville aquiclude	Burkeville aquiclude	Burkeville aquiclude
			Jasper aquifer — Upper unit			Jasper aquifer	Jasper aquifer — Upper part of Jasper	Zone 4		Jasper aquifer	Jasper aquifer	Jasper aquifer
			Jasper aquifer — Lower unit					Zone 3				
							Jasper aquifer — Lower part of Jasper	Zone 2				
								Zone 1				